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INTERNATIONAL NEWS IN BRIEF

SEMS plans new mini line

FRENCH minimaker SEMS plans to introduce a new line of minicomputers to replace the aging Mitra line inherited from CII. The new machines, designated series S is due to appear at the end of the year or the beginning of 1979, and is said to offer a price-performance better than that of SEMS' other product line, the Solar 16, inherited from Télémécanique.

However, concern has been expressed in France at the departure of several former Télémécanique employees, and at the impact that the Honeywell Level 6 mini, shortly to be built by CII-HB as the Mini 6, will have on SEMS' business.

Swiss deal

SWISS marketing of Digico's new M16E minicomputer is to be handled by Infotech, a subsidiary of Bachofen AG of Zurich, a leading Swiss company in industrial automation. The first machine has been installed at the company's headquarters, but a Digico machine has been running at Zurich University geology department since 1973.

NCR \$280m sale

THE sale of NCR's Appleton Papers division to British American Tobacco for \$280 million, announced eight weeks ago (CW, May 11), has now been completed. NCR wants to devote all its resources to expansion of its computer, terminal, DP equipment and services business.

US takeover

GRAPHIC display systems builder, Imiac, and Hazeltine, which is best known in Europe as a major OEM supplier of alphanumeric displays, have signed a letter of intent which will probably lead to Hazeltine acquiring Imiac. Hazeltine and Imiac, both based in the US, had revenues of \$86 million and \$4.5 million respectively in their last fiscal years.

Sabena system

BELGIAN national carrier Sabena is spending \$3 million with Univac on an I100/12 miniframe and UTS 400 terminals which will be used to run air cargo and message switching applications. Sabena runs its reservations on another Univac system, Air France's Alpha 3 in Paris.

Interdata-based IBM emulator comes to Europe

LATEST IBM-compatible processor to enter the European market is a product built around the Interdata 7/32 mini with added microcode for the IBM 370 instruction set.

Launched a year ago in the US, the machine is called Duo 70 and was developed by Kardios Systems Corp of Gaithersburg, Maryland (CW, July 28, 1977). It is being marketed in Europe by Interdata AG of Basel, Switzerland.

The firmware emulator operates with the Interdata OS/32 MT operating system in

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US databases offer to Third World countries

THE US government is expected to offer developing countries terminal access to all the major databases publicly available in the US as its principal contribution to a big inter-governmental congress on computer development which takes place in Spain next month.

Called SPIN, Strategies and Policies for Informatics, conference, the meeting takes place in Torremolinos, Spain, from August 28 to September 6.

The SPIN conference is being organised

by IBI, the Intergovernmental Bureau for Informatics, headquartered in Rome. IBI currently has 25 members, but nearly 100 countries are expected to be represented at the conference, most of them by the government minister responsible for computer policy.

There are three Western European member countries, France, Italy and Spain, and France is the leading member, putting up 30% of IBI's annual \$2.5 million budget. The other members are all non-aligned Third

World countries in Latin America, the Middle East and Africa.

The purpose of the conference is to bring about an exchange of information on the establishment of national computer policies, to highlight the ways in which computers can aid development, and to establish a framework for international assistance and co-operation in computing.

Two member countries, Tunisia and Ecuador, have established national computing plans with the assistance of IBI.

CII-HB price cut wins £7m contract

From Pelle Bergstrom in Stockholm

A LAST-MINUTE price cut, made "in anticipation of falling hardware costs", has helped CII-Honeywell Bull to become the surprise winner of a major government contract in Sweden over the majority Swedish-owned Saab-Univac. The contract, for 22 medium-scale Level 64 systems, ends a six-year period in which every major State contract has gone to Univac.

Worth \$9.9 million Swedish Krone, about £7.1 million, the order is for French-built Level 64/40, 64/30 and 64/20 machines for regional tax authorities, and covers enhancements and

maintenance up to 1990. Until the last minute, the two leading contenders for the contract were Saab-Univac, bidding 90/30s, and Siemens, with 7.738s and 7.730s. The systems are to be linked to a large-scale Univac 1100 miniframe in Stockholm, which has already been installed; at present, 14 of the regional tax offices have old Datascab D21, D22 and D220 small mainframes, and Saab-Univac offered to buy these back in furtherance of its bid.

Univac's bid was ruled out on the grounds that regional planning applications may be added to the systems later, and the

90/30s had insufficient capacity. That left Siemens, whose 7.700 systems had the edge in both price and performance; but the company has a limited service organisation in Sweden.

Siemens' original bid in March was SKr 69 million, which was higher than either CII-HB's SKr 64.4m or Saab-Univac's SKr 61.5m. However, Siemens subsequently undercut Univac, and the latter responded with a cut to SKr 57.7 million.

Honeywell's last big State order was for the social security agency in 1971, since when oil major orders have gone to Saab-Univac.

Human rights concern as US ships three fingerprint systems to Brazil

From Hesh Wiener in New York.

THE US State Department has approved the sale of three powerful computer-based police fingerprint systems to Brazil, despite fears that they could be used to infringe human rights. Recently, the State Department refused to permit similar systems to be shipped to the

Argentinian government. The Brazilian police dossier systems, which automatically classify and retrieve information based on fingerprints are reportedly being built by a division of California-based Rockwell International and are similar to those being used by the

Royal Canadian Mounted Police.

According to State Department sources, three systems will be sold to the Brazilian government. They will be operated by the State police and the Secretariat of Public Security in the States of Bahia, Sao Paulo and Brasilia. The export licences for the systems, recently approved, have been under consideration since January.

State Department sources say that each system is worth about \$5 million. Total processing power of each unspecified configuration is said to be 16 mips, implying that the machines have multiple processors. Official sources said that the three systems were similar, but would not say whether they were all identical.

The storage capacity of each computer will include two million bytes of main memory and 2,400 Megabytes of disc capacity.

\$66,000 award to Datapoint in 'equal opportunity' suit

A JUDGMENT for legal costs amounting to \$66,540 plus 9% interest has been awarded to Datapoint Corp, manufacturer of Intelligent terminal systems, against the US Equal Employment Opportunity Commission. The Commission brought a suit against Datapoint in 1974 alleging discrimination against blacks, Mexican-Americans, and women, but lost the case.

The Federal Appeals Court in San Antonio, Texas, has upheld the judgment in favour of Datapoint, saying that the Commission's action was "arbitrary" and brought "in bad faith". The award of costs is the largest the EEOC has had to pay. A spokesman for the EEOC would not comment on the case other than to say, "The suit was brought in good faith."

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Systems analysts on \$24,786 a year

SYSTEMS analysts in the US, on average, earn \$24,786 a year, with 26% receiving over \$30,000, according to a survey by the Association for Systems Management, while the average starting salary was found to be \$18,000.

The survey also showed that job switching is continuing to increase — 21% of those questioned had worked at three or more jobs, while 31% had worked for only one company. A similar survey in 1969 had found that 13% had changed jobs more than three times.

Two-thirds of the respondents had at least one degree, and 23% had a master's degree or doctorate. However, those with no university education showed a slight increase in number, but their median salary was \$23,000, as opposed to the graduates' \$26,000.

The responses were taken from 3,355 members of the ASM.

Norway wins Indian order

THE contract to specify the network and install the large computer system for India's National Informatics Centre has been won by a Norwegian bureau, Computas of Oslo.

The National Informatics Centre is being established in New Delhi as an information retrieval system and national planning tool for most of the ministries in the Indian government.

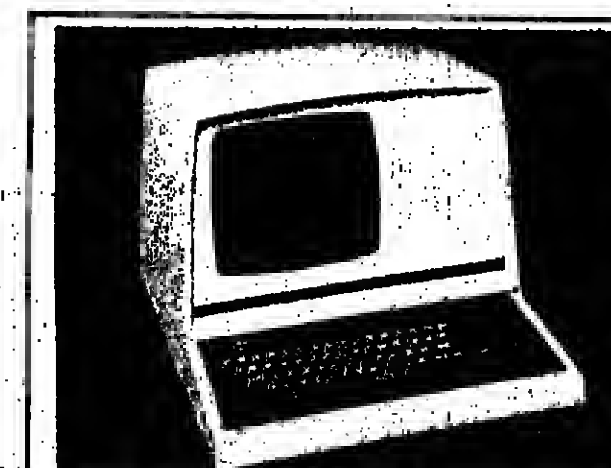


Ex-NATO chief
joins Raoal

A FORMER NATO Supreme Commander and Admiral, Chief of Defence Staff, Admiral of the Fleet Sir Edward Ashmore GCB, DSC, has joined the board of Raoal Electronics Ltd, the holding company for the International Raoal Electronics group.

Sir Edward retired last year after 44 years' distinguished service in the Royal Navy, during which he specialised in communications, a key area of Raoal's activities.

For 10 years before he became a NATO Supreme Commander and Admiral-in-Chief of the British Fleet in 1971, Sir Edward had responsibility for the operations and technical administration of naval communications on sea and land.



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NEWS AND VIEWS FROM SOUTH AFRICA

Dilemma over role of US business in apartheid

THE role of US business in South Africa, and particularly that of the computer industry, is commanding substantially more attention these days than ever before.

Two reports on this business involvement in South Africa, which represent widely divergent political viewpoints, have just been produced in the US. Both examine the morality of providing computers to the South African regime. Each study purports to consider, as the basis of any worthwhile business policy, the welfare of all the people of South Africa.

The case for US computer companies refusing to do business in South Africa is set forth in a soon to be published report written by Richard Leonard, a former staff member of the American Committee on Africa, a New York-based anti-apartheid organisation.

The ACOA study, an advance copy of which was made available to Computer Weekly, looks at the extent of US computer industry penetration in South Africa and at the resulting dependency of the South African economy and the system of apartheid on American companies.

The case for doing business in South Africa was presented by Fortune magazine in an article by Herman Nickel, a member of the magazine's board of editors.

Fortune does not focus on the computer industry, but its concerns and conclusions apply to all US corporations in South Africa. Fortune comes out in favour of the continued presence of American industry in South Africa. It notes that: "It is true that in some sectors the American role is critical, probably the most important being computer technology, where US companies led by IBM control 70% of the market."

Fortune puts forward the thesis that US investment in the South African economy is needed for peaceful change. It also holds that "for many black workers in South Africa, training programmes in American companies provide a major part of their entire education."

The ACOA report, entitled "Computer apartheid: the role of US computer companies in South Africa", states that the largest computer user in that nation is the government, controlled by the 16% of the population that is white. ACOA argues that computers are used for the

implementation of apartheid, for military and policy functions and for economic purposes.

According to ACOA's statistics, there are five US minicomputer companies with operations in South Africa. In some cases these companies sell small computers as well. The companies are IBM, Burroughs, Control Data, NCR and Univac. Other US computer companies with operations in South Africa are Hewlett-Packard, Data General, Datapoint, Computer Automation and Computer Sciences.

In addition, there are several US companies which have computers in South Africa but which do not have computer operations there at present. Honeywell has withdrawn from the computer market, although it still has other corporate operations in South Africa. Digital Equipment has no South African offices, but it has sold some of its computers there. Foxboro Corp. has at least two of its Fox 1 computers installed in South Africa used at the strategic Valindaba uranium enrichment plant, but no South African offices.

Historically, according to the ACOA report, South Africa was late among the industrialised countries to enter the computer age. The first computer in South Africa, a UK one, was not installed until 1959. During the 1960s the installed base expanded at a rate of more than 30% annually and by 1970 there were an estimated 400 computers in the country with a value of \$100 million.

It was during the growth period that US manufacturers came to dominate the South African market, led by IBM. By 1974 the total number of systems in South Africa was estimated at more than 1,000, with a value of \$365 million. And while its economy fell into a recession in the mid-70s, computers were "selling like hot cakes", with market growth estimated at between 20 and 30% annually.

In September, 1978, South African Interior Minister Mulder said that there were 1,500 computers in the country representing an investment of more than \$500 million. Management magazine of South Africa noted in its December, 1977, computer survey that only the US and the UK spend more than South Africa on computers as a percentage of gross national product.

This same survey also noted that while the US computer companies still dominate the South African market, ICL had replaced IBM as the market leader. In 1977, ICL sales jumped by 68%, compared with an industry average of 25%.

The reasons for ICL's rapid expansion are not clear, but tighter US regulations on computer sales to South Africa could be a factor. South African fears about the impact of US restrictions has led to the growth of indigenous South African manufacturers (CW, March 23).

According to ACOA, in the sale of microcomputers and minis US companies face competition from the UK, Japan, West Germany, Italy and now the local South African companies as well. But the only companies now in South Africa capable of providing mainframes, aside from US suppliers, are ICL and Siemens.

Fortune magazine points out that sentiment in Washington is increasingly turning against South Africa, "particularly since the rioting in Soweto in 1976 and the explosion of worldwide outrage over the case of Steve Biko".

The publication also cites the US Senate report, prepared under the chairmanship of Senator Dick Clark, which said that the abysmal record of US employers in South Africa threatened to undermine "the fundamental goals and objectives of US foreign policy."

Other Congressional action directed against South Africa is in the works, including a Bill that would cut off government loan guarantees. This action Fortune calls "extreme."

Concern over the effectiveness of current US efforts to curb certain computer industry involvement in South Africa led ACOA to conclude that "the current restrictions by the Carter Administration, while posing a hindrance to the White regime, certainly fall short of any serious effort to end the involvement of US computer companies with apartheid."

Faced with growing pressure from groups like ACOA, US computer manufacturers have been issuing public statements in defence of their activities. The US computer companies maintain that their presence is a moderating force and that they provide jobs and opportunities for advancement for non-whites.

The computer market in this country," Godsell observes, "is constantly changing in terms of both computer supplying companies and an increasing flow of new, better and cheaper products."

"We have seen companies such as Honeywell and Siemens enter the market and then depart. The British giant ICL took over the Singer Business Machines market and some of the big US companies have established themselves as forces in the market only recently."

This year, Godsell adds, several new minis and systems have been introduced, including Prime, which is marketed by the

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The Dataskor 3000 programmable data terminal from Data Corp.

Durban places first orders for program terminals

THE City of Durban has placed the first order for 35 new South African-designed and manufactured programmable data terminals which have a local content of 72%.

The Dataskor 3000, manufactured and distributed by Data Corp., the newly-established computer arm of the Maraisburg Office Equipment Group in Johannesburg, is designed to fill a gap in the market for data collection and recapturing facilities, said the company's marketing manager, John Anderson.

The Dataskor 3000 is a microprocessor-based terminal, which can be used as a stand-alone unit or online. It can handle a variety of data capture, accounting and point-of-sale applications.

Present options include custom-designed keyboards, a second cassette tape deck and a software-controlled cash drawer. Future options are likely to include up to 32K EPROM storage, up to 8K data storage and a wand reader.

Anderson believes that these could be an export market for the Dataskor 3000 terminal in independent African States, Europe, the UK and Australia.

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Australia is hit by computer crime

BUSINESS in Australia is hit increasingly by computer related crime, but management is burying its head in the sand and hoping that the problem will go away. Making this comment, the Sydney chapter of the Electronic Data Processing Auditors' Association says that an increasing proportion of the \$A500 million a year that "white collar" crime is said to cost now involves computers.

A spokesman for the association said it was estimated that there were about 2,000 computers in the country and about 20,000 DP staff. Although that was small by US standards, it was worth remembering that the foreign assets and investments they control were not.

NEWS IN BRIEF

IBM profits doubled

A DRAMATIC surge in IBM Australia's profits has been reported for 1977. The big improvement is attributed to the high level of outright sales.

Profits at \$A16.55 million after tax of \$A13.79 million were more than double the 1976 figure of \$A7.75 million on a turnover of \$A181.9 million, up from \$A120 million in 1976.

PoS network

WITH orders for 760 NCR 2151 point-of-sale terminals, 42 NCR 796 VDUs, 74 NCR 725 minicomputers, Australian department store group Walltons has begun its plan to install a major PoS network at its stores over the next three years. The PoS network will be linked by Post Office lines to an NCR V-8550 Criterion system in Sydney, and it will enable Walltons to monitor and control profitability, inventory, sales trends, and advertising more efficiently, as well as improving customer service.

Latin exchange

WHAT is claimed to be the first digital telephone exchange in Latin America will be installed in Caguas, Puerto Rico, and become operational this year. The contract worth \$2.2 million is for an EAX 3 stored program controlled exchange switching 3,000 lines from General Telephone and Electronics Corporation in the US. It can be expanded to handle up to 60,000 lines.

Egyptian contract

A \$1 MILLION contract for a natural gas distribution control and monitoring system has been won in Egypt by Westinghouse Brake and Signal of Chippenham, Wiltshire. The contract is in connection with the Abu Qir natural gas distribution project, and will include twin Digital Equipment PDP-11 minicomputers running the Westinghouse Wesdac software package.

Marketing deals

MAGNETIC tape transports produced by Digi-Data are to be marketed in the Benelux countries by Megavolt of Holland and in Norway by the Oslo-based Morgensterna.

Dublin office

To handle growing business in the Irish Republic, Data General has opened a Dublin office at St. James' House, Lower Baginbun Street. Sales and software support had previously been provided from Manchester, but the entire operation will now be carried out locally.

Fujitsu subsidiary profit

THE Australian subsidiary of Fujitsu, Facom Australia, came into profit for the first time in the year to March 1978, but still has a long way to go to wipe out its accumulated losses of \$A9.03m, which include a

Australia is reputed to produce some of the world's most proficient white-collar criminals. A senior investigator of the Corporate Affairs Commission in New South Wales is on record as saying: "Per head of population, in all spheres of white-collar crime, Australians rank as one of the most distinguished groups of people in the world."

The fear among Australian computer people is, that as matters stand, there is little to deter this "distinguished group" from schemes of million dollar embezzlement through computer crime.

The 7,000-member Computer Society of Australia has issued computer security standards for Australian companies, which have been endorsed by the auditors' association, but within the Australian security business the feeling generally is that Australian management is more concerned to lock the computer than to employ expert DP auditors to check the programs for criminal activity.

There have been very few reported Australian computer crimes of any magnitude, and the Australian investing public is less accustomed to its reality than are Americans. For that reason management is more inclined to dismiss employees found guilty of fraud and embezzlement, than prefer criminal charges, since a scandal may well adversely affect the standing of the company.

Neither can foreign investors expect much protection from the Australian police. At a national crime seminar last year, delegates were told that more and more Australian criminals were turning to white-collar crime — in one State alone there had been an increase of 220% in fraud over the previous year, but the lack of technically trained staff rendered the state's police force powerless to deal with it.

The first seminar for police on computer crime was held last year at which 30 officers were given a five-hour lecture. The head of Sydney's fraud squad said: "In the end, we are going to have people specialising in computer crime."

But Australia already has people specialising in computer crime. Last year they stole an estimated \$A10 million, and

Conference in Canberra

CANBERRA is the venue of the Eighth Australian Computer Conference, which takes place between August 28 and September 1. The programme will include workshops and short courses, poster sessions, an exhibition and a personnel computing fair.

The extensive social programme includes visits to the Orromi Valley Tracking Station, the Snowy Mountains, and the Sydney Nolan Exhibition. The basic conference fee is \$140. For further details apply to Eighth Australian Computer Conference, P.O. Box 448, Canberra City, ACT 2601.

\$A3.45m loss last year. The profit for 1977/78 was \$A9.072, and the company is not forecasting much more for the current year. Facom Australia did not reveal its turnover for the year, but is believed to be seeking \$A12m.

Look what happens to cats Down Under!

THE latest thing to happen to cats in New South Wales is to have their pedigree registered on an ICL 2803 installed by the State's Royal Agricultural Society. The records are put on file with the help of Checkmaster, a real time animal registration package from System Aid of London. Checkmaster has also been used to register Australia's pedigree dog population, but in the UK crows have been the only customers so far. The Friesian Cattle Society uses it for its records. Here, Nick Wetherhouse managing director of System Aid, and Felicity look at one of the certificates that the system produces for Aussie cats.

NCR terminals for Victoria store

AUSTRALIAN department store group James McEwan has installed 240 NCR 255 point-of-sale terminals in 25 stores in Victoria. These are linked to an NCR 728 minicomputer in each store, and the company plans to form a network over dial-up telephone lines to a 192K NCR Criterion 8550 at its warehouse in Melbourne.

Value of the total system is about £1.5 million. Sales of each item are reported and the effect of price changes can be gauged quickly. Gross profit is reported weekly, and this avoids the laborious task of retail inventory.

The system also provides better cash control, credit checking and customer statistics, according to the company.



Most companies buying computers don't know what they are doing

Recent surveys show that more than half of the companies buying computers have contacted only one manufacturer. This is strange, taking into account how large their investment is. Because we do not believe that anyone can be sure of the right choice without knowing what other firms can offer. Big is not always best. Although Norsk Data is not among the biggest, our NORD computers have often come out

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England: Norsk Data (UK) Ltd, NORD House, 17 Balle Street, London W1, Tel. 01-278 8601, Telex 299 887.
Norsk Data A/S develops, produces and markets NORD Computer Systems. The NORD system has found extensive use in research and education, production control, data processing and networks; the application areas are continually increasing.

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MARKETVIEW

Since Amdahl delivered his first 470V/6 processors three years ago, at least six other manufacturers have announced processors that can execute IBM 370 machine code, including no less than three new ones in the second quarter of this year. Is there a lasting market for IBM 370-compatible

processors from independent manufacturers? Can the demand support so many different competitors? Will they be able to follow IBM in price cuts as drastic as those that accompanied the announcement of the top of the range 303X series in 1977? What happens if IBM embeds more systems

software in microcode, or charges for future releases of its operating systems software? What sort of a growth path have the users of independent 370-compatible processors?

In this Marketview, Fred Lamond discusses the background to the current boom

in IBM compatible processors, and provides a guide to the systems currently distributed and supported in Europe, and those that may be in the future after an initial look at the North American market, and a question, "What will happen when IBM cuts its hardware prices to their level?"

The IBM compatible processor market

Is it boom or bubble?

The idea of offering "compatible" hardware to the huge IBM user base is hardly a new one among competing manufacturers. Almost every minicomputer and terminal manufacturer offers IBM 370 data exchange compatibility today via 2780 and/or 3270 bi-synchronous communications protocols. If not IBM 3741 compatible diskette or nine-track magnetic tapes.

Honeywell, ICL and NCR all offer general purpose computer systems that are data structure compatible with the IBM 370 range at some price performance levels, which usually carries with it a measure of Cobol and Fortran source program compatibility as well.

Even IBM Assembler compatible computer systems have a 16 year history behind them. Honeywell announced its 1400-compatible 200 series in 1962, and English Electric Computers and Siemens their 360-compatible System 4 and 4004 series in 1965. Siemens still manufactures the 370-compatible 7000 series and has

been joined since 1973 on the European market by Univac with its Series 80. Philips also marketed the 380 Assembler compatible P1000 series on the Continent from 1968 to 1973.

All these Assembler-compatible systems have only implemented the IBM 360 and 370 user instruction sets, however, but defined their own "privileged" instructions to implement their own operating systems. Replacement of an IBM 360 or 370 system by one of these Assembler-compatible systems has thus always involved the user in converting all the JCL commands in his source programs before recompiling them to run on his new system.

This did not involve the user in any more effort or expense than a conversion from DOS to OS if he stayed with IBM, and was frequently easier. Both Siemens and Univac have thus scored most of their IBM user "knock-offs" among 360/40, 370/125 or 370/135 users who had outgrown DOS or DOS/VS multiprogramming capabilities, or among 360/20 or System 3

users attracted by the longer JCL-compatible growth path offered by both Siemens and Univac.

But users of IBM's medium to large systems who had already undergone the cost and effort of converting their source programs to an OS operating environment have mostly been unwilling to contemplate a

further JCL command conversion to another manufacturer's operating system for the sake of marginally cheaper hardware rentals or purchase prices. They were thus, until 1975, locked effectively into the IBM 370 processor range, even though they might still order their terminals and communications processors, and sometimes even their

peripherals and main memory extensions, from manufacturers other than IBM.

What Gene Armdahl pioneered in 1975 was a new degree of machine code compatibility: one that is no longer confined to the user instruction set but includes the privileged IBM instructions as well, and therefore allows user's systems to be run

under whatever operating system the displaced IBM 370 has been using. It also enables user object code programs to be executed unaltered even without any recompilation. Amdahl thus offered large IBM processor users, for the first time, a genuine alternative economic source of supply for their core processors.

Amdahl also pioneered a new degree of marketing specialisation. Instead of feeling obliged to offer the enormous R&D cost for a complete family of processors of all sizes and machine peripherals to compete against IBM, he has specialised in the manufacture and marketing of large central processing units and their memories; those of equal or greater power to IBM 370/168 and so performance competitive with their IBM 3032 and 3033 processors. His CPUs are "socket compatible" with the IBM 370 processors, that they displace, that his users can retain the IBM peripherals, or add peripherals from a plug compatible manufacturer.

Manufacturer	IBM	Amdahl	Fujitsu	Hitech
Distributed and maintained in Europe by	IBM	Amdahl	Siemens	Itel
Equivalent models (Number of CPUs/system in brackets)	3033MP (2) 3033UP (1) 3032 (1)	470V/7 (1) 470V/6II (1) 470V/5 (1)	M200 MP (2-4) M200 (1) M180 II (1-2)	AS/6-7032 (1-2)
Operating systems	OS/MVS or OS/VS 1 or VM/370	OS/MVS or OS/VS 1 or VM/370	OS/IV-F4	OS/MVS or OS/VS 1 or VM/370

Table 1. Large and very large IBM compatible processors

A CORAL CASE STUDY

An Oxford Medical Computer Centre project relies on CORAL 66 for its real time control software. The project is concerned with patient care administration and has planning and research data being produced as a by-product.

In the system each participating hospital is linked to a minicomputer running the patient administration system. A database on another mini contains summaries of patients case histories. The machines used are CTL Modular Ones for which RSRE wrote the original compiler. Visual display terminals provide direct access to the computer and the real time system permits information on patients to be updated as events happen.

Staff in the Patient Administration Centre enter patients details before they enter the hospital. Their admission, location, progress and discharge are entered as they occur. At any time, the system has case details of the patient but can give information for research or administration. For example, a bed status report allows the admissions office to locate spare beds at short notice.

Apart from aiding quick and efficient hospital administration the minicomputer system saves considerable costs yet provides a real time capability.

A special committee has been set up to safeguard confidentiality and one method of respecting privacy is the use of passwords for identification and authorisation.

"Caring with Coral"

Training

Corporation in CORAL 66 is regularly being offered by several organisations including CCOB, Coranet, GEC, NCC and SCL. NCC is now running the first time program design course which is fully developed for the CORAL 66 group. The course deals with structured programming, hierarchical design, synchronisation of parallel processes, interface design and program quality, documentation and inspection.

MASCOT

A test time systems development and run time environment for CORAL 66 is on its way. MASCOT - Methodical Approach to Systems Construction. Openness and Test - allows CORAL 66 programs to be broken down into independent parallel activities. The system communicates with each other via formal interfaces and occurs mechanisms and are scheduled and controlled by the MASCOT kernel. As well as providing excellent run time control, MASCOT offers parallel programs to be developed independently and to be formed into an executable system.

MASCOT development is being controlled by a joint industry - MO Group with major work packages being undertaken by software houses including CAP, Software Sciences Ltd. and Systems Designers Ltd. A MASCOT alliance document has been issued and is available from SASE. Commercial products using MASCOT should be available later this year and there is already a two year history of experience in proving MASCOT in defence real time applications.

A workshop on MASCOT is being planned by Intotech for later this year.

USER GROUPS

The user group meets and discuss the language and not passed by the CORAL community. The British Computer Society's CORAL 66 specialist group meets about every 6 months from September to May.

CORAL

Published by NCC on behalf of the Department of Industry, sponsored by CORAL

By Fred Lamond

grated adopters and byte-multiplexer channel of an IBM 370/138 and 148. Both Magnuson, M-80 and Notionol Semiconductor C-400 main memory, for instance, can be expanded to a maximum of 16M bytes against a current maximum of 1M on the 370/138 and 2M on the 370/148. All competing medium size systems also offer field-expandability over a price-performance range where

IBM would require CPUs to be exchanged at least once. Many consultants and IBM users are, however, asking how long can the IBM-compatible processor manufacturers maintain their advantage? What will happen to them when IBM cuts its processor hardware prices to their level, and/or announces new unbridled operating systems or extensions with sections embedded in firm-

ware microcode?

As far as the effect of IBM price cuts goes, we already know the answer. When IBM replaced the 370/158 and 168 processors by the almost identical 3031 and 3032 processors in November 1977, it priced these new models at less than half the price that it had charged for their predecessors until a year ago. It thereby brought their prices some 10 per cent below

the US prices of competing Amdahl and Itel models. But this sharp price cut caused a flood of orders for the new 303X processors from processing-power hungry users that IBM will be quite unable to satisfy out of its current production capacity in under two to three years.

While a few users have cancelled Amdahl or Itel orders for

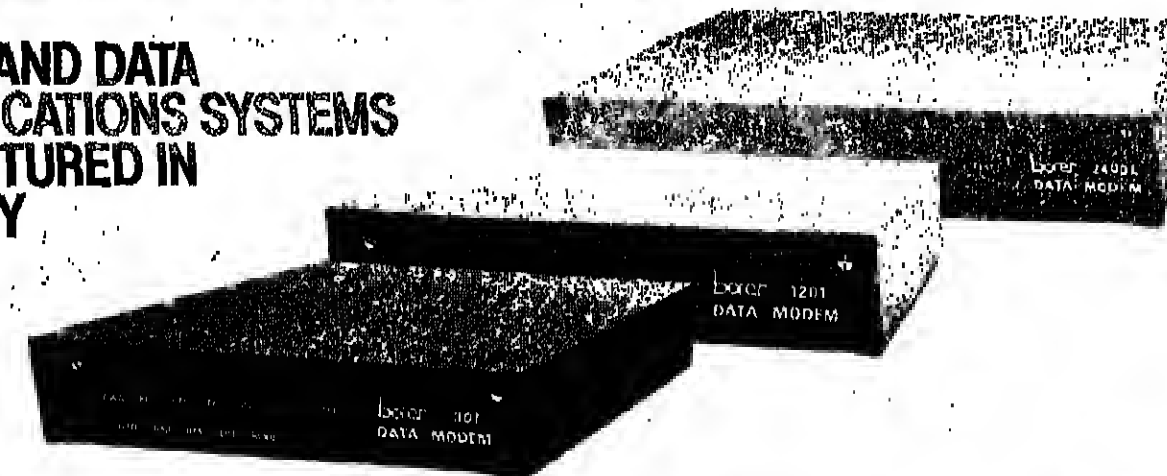
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Manufacturer	IBM	National Semiconductor	IPL Systems	Magnuson	Two PI
Distributed and maintained in Europe by	IBM	(1) Itel	(2) —	—	CSS International
Equivalent models (Number of CPUs/system in brackets)	3031 (1) 148 (1) 138 (1)	AS/6-7031 (1-2) AS/4 (1-2) C 400	— — —	IM 80/51* M 80/4 (1) M 80/3 (1)	— — CS8 3200 (1)
Operating systems	Any IBM	Any IBM	Any IBM	Any IBM	VP/CS8
Maximum main memory capacity on largest model in table (bytes)	8 M	8 M	16 M	2 M	18 M
Smaller models field-upgradable to larger models?	No	Yes AS/4 to AS/6	Yes	Yes	—

Table 2. Medium to large IBM-compatible processors. Note: *Model promised for announcement by the end of 1978.

THE BRITISH CONNECTION

MODEMS AND DATA COMMUNICATIONS SYSTEMS MANUFACTURED IN BRITAIN BY BORER



for the first time, a genuine alternative economic source for the supply of... central processors

rounded off their product lines with IBM-compatible processors, then their other competitors — Memorex, BASF and Storage Technology — will be fighting for the privilege to market the Magnuson M-80 series in Europe.

The rapid development of this IBM machine code compatible processor industry has been due to the same reason which prompted the earlier growth of IBM-compatible peripherals manufacturers from 1965 and of PCM memory manufacturers from 1968, ie a growing gap between IBM technology and prices and possibilities offered by the latest state of the art. Current IBM processor models are but little altered variations of late-1960s designs first announced in early 70s.

In the case of the top of the range 370/158 and 168, their price gap had become all the wider as IBM had actually raised their CPU prices — by 40% in 1972 when they replaced the little different 370/155 and 165, and a further 15% at the beginning of 1975 when the 370/155-3 and 168-3 replaced the earlier 158-1 and 168-1.

All the processors offered currently by Amdahl and his six imitators use more highly integrated and, therefore, more compact and less costly LSI or VLSI components and memories than the IBM 370 and 303X processors against which they compete.

The medium-size National Semiconductor C400, Two PI 3200, and Magnuson M-80 processors use a high-speed minicomputer bus architecture which makes it much easier to expand their main memories and/or connect a greater number and variety of microprocessor driven I/O subsystems to them than to the inte-

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Hesh Wiener talks to Gene Amdahl about the way he is planning to improve the performance of the Amdahl systems

Amdahl says the 470V/7 will be 10% faster than announced speed

HOW fast will the 470V/7 be when it is shipped next month? "More than 10 per cent faster than the announced speed," says Dr Gene Amdahl—and possibly significantly faster than even that.

Accepted by most observers as the fastest general-purpose computer in the world, the 470V/7 will leave Amdahl's Sunnyvale, California factory with nearly twice the power of the company's 480V/6, easily twice the speed of an IBM 370/188, and, depending on the way you measure things, as much as 50 per cent more than IBM's most powerful processor, the 3033.

The improvements in the computer's design will not delay first customer deliveries.

"We announced that we would ship in August," recalls Dr Amdahl, "and we'll probably ship the computer at the end of that month. We will use all the time between now and then to improve the limiting critical paths."

So far, the effort to locate bottlenecks in the computer system and eliminate them, has paid off. The improvements in performance will come without any penalties in price, reliability or ease of use. The search for further enhancements to the machine continues on a daily basis.

First, Amdahl Corp personnel fire up the machine and load it with work that typifies the mix of problems users will be solving. Then, engineers monitor the various paths information takes through the machine to see where any time might be gained by redesigning a circuit. Finally, the changes must be implemented and further testing done. There is no certainty that an improvement in one function will actually improve the system's performance.

Amdahl explained the process using hypothetical examples.

"It could well be that the middle bit of an address path involves a time consuming test to see if you are crossing some boundary in the machine. That might be the critical path, the thing that takes longest to do. So you redesign that, and it is no longer the critical path. Now perhaps the critical path is when the data comes out of the cache and you have to check to see which of several items is the one you want. So you redesign that part of the system."

Not only must the computer run a three-ring circus of parallel processes; it must simultaneously monitor its every function in the event of some failure.

To maintain customer confidence, the Amdahl computers not only have to run faster than anything else in the world; they have to run more reliably, and, if they break down, they must help technicians with the repair process. It was only by exceeding every industry standard that Gene Amdahl could sell his first offerings, and it will be through continued leadership that he keeps the queue of customers lined up at his front door.

For Amdahl Corp, the advantage of selling computers that run IBM software is accompanied by a risk: should the company fail to deliver computers that meet or exceed customers' expectations, users can switch back to IBM without much difficulty.

The risks of mainframe ventures may also be increasing because prices have been falling rapidly and will continue to drop. When Amdahl first went into business, the IBM price umbrella was a lot bigger than it is today.

IBM has controlled the mainframe market since the announcement of the System 380 and, Amdahl believes, this has enabled the company to keep prices relatively high.

"They have not reduced prices with the (changes in) technology, and at this time we can consider most of the computer market essentially to be striving."

"It's an elastic market as far as it may get sat, and the market size could drop, but it's going to end up at a much higher level than it has been in the past."

But the rapid pace of technological progress has led several vigorous competitors into the fray during the past year. Price wars could occur, as they have in other markets for electronic equipment.

"We may find," observes Amdahl, "that the revenues might not grow because prices are coming down and the elasticity might not be quite high enough." "Think of the history of computing demonstrates that reduced prices result in greatly expanded markets. Nevertheless, no market remains perfectly elastic as it grows, and industries inevitably mature.

Wall Street calm

THINGS have been pretty boring on Wall Street. The stock market has no clear direction and the stock analysts, puzzled by the recent decline in the market after some sharp rises, have yet to explain fully investors' indifference.

With no crises on their minds, the financial analysts seem lost. They have even become tired of complaining about the seeming hypocrisies of the Carter Administration. Interest rates have moved upward and inflation shows no sign of abating.

Beneath this calm surface, however, there are some indications that investor confidence in the computer business is not as great as the order backlog that most vendors claim to have.

Digital Equipment, for example, which has had its share of trouble on Wall Street, has been suffering further the erosion in its stock value. At a time when the company may need to raise funds for expansion, this does not bode well.

Honeywell, which only gets about half its revenues from computers, is another company that may be hurt by present economic conditions in the US. Construction, sensitive to interest rates, is falling. Housing starts are off quite a bit and are expected to continue to slide and with that goes the growth of Honeywell's large business in heating/cooling system components. This may explain some of the change in short interest in Honeywell stock.

Whether or not the growth of the computer industry slows during the next few years, Amdahl Corp, like its rivals, must continually seek improvements in its systems. The company is hoping to build faster and more dense circuits during the coming years. Amdahl is also working on a way to improve

markedly the design of its channels, which today are functionally identical to IBM's.

The channel improvements will involve, according to Amdahl, "paired streams of I/O." Today's channels cannot reverse very rapidly, and thus, at electronic speeds, they seem to be one-way paths, which limits the

use of mainframes in certain applications. A channel that could move data in two directions very rapidly would permit interactive links between computers and peripherals.

Amdahl cites banks' check-processing machines, where "a stream of information is coming in and it must be compared to

something in memory, which then causes other information to be sent back out," as a good application.

A channel that can switch directions may also perform the functions of the present IBM compatible channel often used in the new functions simply to enhance the industry standard.



"We can consider most of the computer essentially to be striving."

Call for world alliance on transnational data flows

THERE is growing concern throughout the world about the effect of transnational data flows but most countries have spent too much time identifying, rather than solving, the problems.

That was the view expressed by Gustaf Adolf Westman, head of the Swedish Data Inspection Board, at a three-day conference in Washington, organised by Information Gatekeepers of Brookline, Massachusetts.

Although the conference featured speakers from the US, Sweden, France, Germany and the UK, it was left to Dr Peter Robinson, chairman of the Canadian government's inter-departmental Committee for Computer/Communications, to

provide the only attempt at trying to quantify the problem.

Using data published earlier this year by his government Dr Robinson pointed out that computing services imports to Canada totalled about \$155 million in 1975, a value which represents about 30 per cent of the services obtained by Canadian users from outside their own data processing operations. "If present trends continue," he said, "imports of service will reach some \$560 million by 1980, about 41 per cent of outside services, and increase to some \$1,500 million by 1985, about 52 per cent of outside services."

"It is not very likely that we will be able to offset this growth in imports by greater exports

from Canada," Robinson added.

The growth in services imports will have a detrimental effect on Canadian job opportunities, he added. The government study indicated that the number of jobs created outside Canada to meet the country's requirements amounted to about 4,400 by 1975, or some 4.5 per cent of the DP-related jobs in Canada at that time.

By 1980, Canada predicts, that number will swell to some 11,000, or about 8 per cent of Canadian jobs, and by 1983 to about 23,000, or about 14 per cent of jobs.

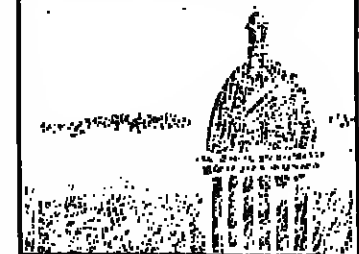
At the same time that Canadian computing is being displaced, Dr Robinson noted, user demands are increasing. Users

spent an estimated \$2,700 million to obtain computer/communications goods and services required in 1975. These costs are expected to rise from the 1975 level to about \$5,600 million in 1980, and to some \$9,500 million in 1985.

To further exacerbate Canada's problems, Dr Robinson said, there is growing concern about the storage of personal data on Canadian citizens outside the country, and particularly in the US. Quoting from a report prepared by the government's Task Force on Privacy and Computers, Dr Robinson touched on an area that is very "sensitive" to Canadians: "As a sovereign state, Canada feels some national embarrassment and resentment over increasing quantities of often sensitive data about Canadians being stored in a foreign country."

The Canadian government feels it is time to act on these problems, Dr Robinson said. "But what form new restrictions, if any, might take, and to achieve what objectives are by no means clear."

John Eger, a Washington attorney and communications consultant, said that the American public "abhors" regulation, partly because the public has little faith in the federal government to solve problems. But at the same time as the US is



pushing towards de-regulation, he contended, other countries are becoming more regulated. "America needs to awaken to the realities that we alone have not come to grips with a national information policy, a trade policy or even a transborder data flow policy," Eger asserted. He also appealed to all nations for "an alliance in world policy" regarding transnational data flows.

A similar appeal was made by Dr David Becker, director of science, technology and industry for the OECD in Paris. "There is a very small step between data protection and data protectionism," he said. In his plea for greater harmony among countries, Dr Becker urged each nation to strive for the former and avoid the latter. "It is impossible to overstate the importance that this be done," he said.

'Information quality council' demand

WITH the completion of the first five of an expected 10 task force reports comprising the US Federal DO Reorganisation Study, one message comes through loud and clear: the management of the government's information technology resources is seriously deficient.

The first five draft reports came from teams that studied the DP environments of standard, personnel, small federal agencies, human resources programs, and acquisitions. The remaining task force reports, which will filter out before the end of the summer, deal with DP in general government, national security, science and technology, operational management and central policy.

The human resources team, which was charged with finding ways DP could improve the government's delivery of human services, took on the added task of chastising the government for commissioning redundant studies that serve no greater purpose than to collect dust in bureaucrats' offices.

While the other four task forces politely acknowledged in their reports that numerous other studies already existed on their assigned topics of research, they nonetheless proceeded to re-identify, re-verify and reference previous findings. The human resources team was the only group to come to grips with the issue of redundancy. It said the President should declare a moratorium on further duplicative studies while the government "consolidates the best of what has already been done" and takes action.

"Most of the previously published reports are excellent, in agreement with respect to findings and, where there was commonality of scope, largely in agreement with respect to their recommendations," the group charged.

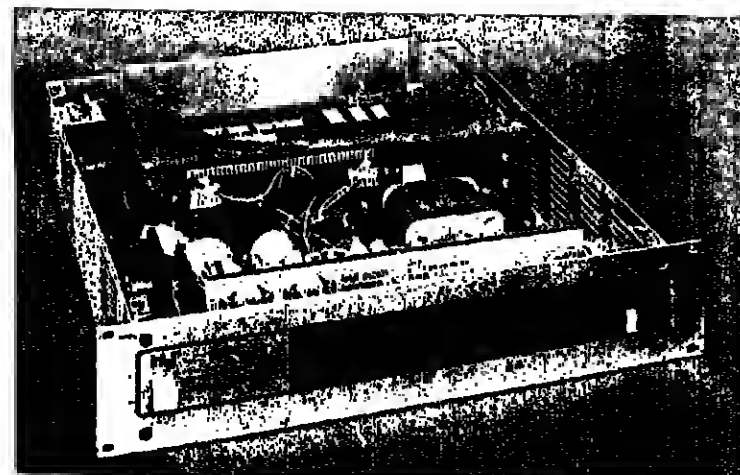
As a long-term solution, the team urged creation of a President's Council on Information Quality, which would operate as an arm of the Executive Branch.

The personnel report stated that the process of examining and certifying a candidate through the Civil Service Commission is overly time consuming and involves too much "red tape." Salaries for entry level DP personnel are \$2,000 to \$3,000 lower in government than in private industry. Job candidates have no central place to visit to determine what positions are actually available. Also, the obsolescence of many federal DP systems adversely affects the government's ability to attract and retain qualified personnel.

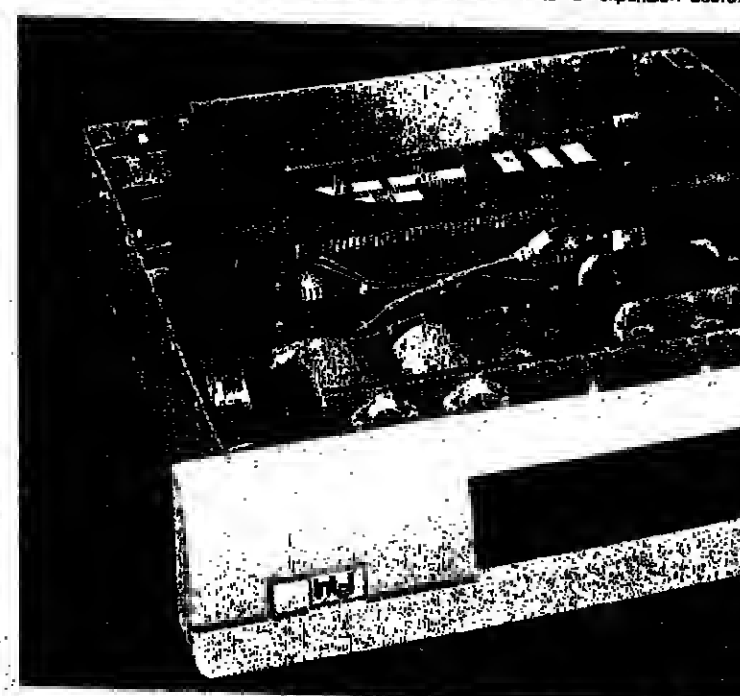
Moreover, the personnel task force complained, "There is no consensus within the federal government on where data processing should be placed organizationally, nor what role it should play in the management scheme of things." Since DP personnel are frequently overlooked when top management positions are open, the team claimed, the government's ability to recruit and retain competent DP people is severely hampered.

The lack of accountability for the success or failure of DP procurements was a pet peeve of the acquisition task force, which noted that private industry would never tolerate such a situation.

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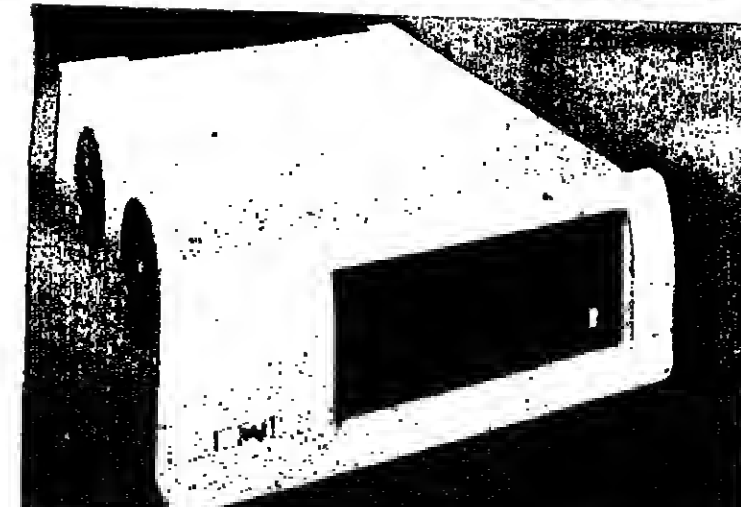
SYSTEM 80/10 The System 80/10 is a fully packaged microcomputer utilizing the ISBC 80/10A Single Board Computer. Ideal for the OEM whose design requires low-cost 19" rack mountable packaging, the System 80/10 offers easy to use, fully programmable I/O, the computational power of Intel's 8080/85, with both RAM and EPROM memory. The enclosed power supply is designed to support not only the Single Board Computer, but also a full complement of additional slots for expansion boards. The chassis houses the computer, power supply, fans, and has three additional slots for expansion boards.



SYSTEM 80/20-4 The System 80/20-4 is a fully packaged microcomputer utilizing the ISBC 80/20-4 Single Board Computer. Ideal for the OEM whose design requires low-cost 19" rack mountable packaging, the System 80/20-4 offers easy to use, fully programmable I/O, the computational power of the ISBC 80/20-4, with both RAM and EPROM memory. The enclosed power supply is designed to support not only the Single Board Computer, but also a full complement of additional slots for expansion boards. The chassis houses the computer, power supply, fans, and has three additional slots for expansion boards.

Real-Time Applications served in the market sectors to date are:

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 - 48 programmable I/O lines
 - ISBC 108 8K byte RAM
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 - 48 programmable I/O lines
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 - 48 programmable I/O lines
 - ISBC 310 High Speed Math Unit
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 - ISBC 508 32 Input Lines
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 - ISBC 517 Combination I/O Board
 - ISBC 518 Programmable Parallel I/O Board
 - ISBC 584 Serial Communications Board
- ISBC 860 Optically Isolated I/O Board**
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- ISBC 732 Combination A/D, D/A, I/O Board**
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Donald Kennett reports from Italy

International nature of Honeywell's Series 60

THE international nature of Honeywell's Series 60 range of systems is highlighted by the enhancements that have been introduced for the Level 62 (CW, June 28). Level 62 was designed in Italy and is being produced at a factory in Caluso, near Turin, with 80% of the production exported.

Level 61 was designed in France, Level 64 in France and the US, and Level 66 in the US. The UK also participated in the software design for the series and manufactures Level 68s in Scotland (CW, April 25, 1974).

Manufacture of Honeywell computers takes place in Newhouse, Strathclyde, the US, France as well as in Italy. The Italian operation has offices and a research establishment in Milan, and a production plant at Caluso.

Honeywell Information Systems Italia markets all Honeywell products in Italy, Iran, Turkey and Yugoslavia. The Caluso plant produces Level 62 computers, serial matrix printers and magnetic tape transports for the company's world market.

The oldest of these lines is a tape cassette deck that started production in 1973 and has reached a total of over 10,000 units produced. For sheer numbers, though, this is exceeded by the serial printer, which, although it is the newest product, has reached a total of 14,000 since 1975.

These are being produced at a rate of 300 a week, but the aim is to increase output to 2,000 a month. This compares with a figure for Level 62 processors of 80 per month. The

reason is that this printer has found a home with Honeywell's whole range of mainframes and minis and also sells to the OEM market.

This is because it can be configured as a console printer, a local or remote terminal or output printer and has a choice of 30 keyboard versions and 50 character sets.

The Level 62 itself has four models, the 62/20, 40, 50 and 60 ranging in price from £45,000 to £250,000. Differences between them include size of memory, amount of automatic error correction, timing and firmware.

Since production started in 1974, changes have been made to keep up with latest technology. From starting with TTL and 1K memory chips Level 62 now makes use of 16K memory chips and other LSI devices so that at 80K bytes, the current basic system memory exceeds the original maximum. The maximum has recently been extended to 512K bytes.

HIS employs 3,700 out of Honeywell's worldwide total of 95,000 staff. It has 55 field engineering offices spread throughout Italy but the biggest concentration of people is in the north, with 1,200 at the Caluso production plant and 550 at the R&D centre at Pregnana near Milan.

At the research centre half the designers and engineers are graduates and they use 22 Level 62 systems in their development work, making it the largest computer centre in Italy.

The Level 62 was designed and developed there, as was the G100 series before it, and the team has over 500 patents to its credit. Patent licences have been sold to the US and Japan, with Japan starting to manufacture Level 62s under licence.

Research work goes on in collaboration with universities and this is a pattern kept up since the company's forerunner Olivetti first started work with Pisa University in the early 1970s. In Italy's first computer, the Elea.

Current collaboration includes software engineering

with Milan and Salerno universities, medical applications with Florence and Pavia and disc drive design with Bologna.

Five international software houses have also had people working at the research centre in co-operation with HISI.

The production workforce of 1,000 at Caluso has an average of 10 years' service in spite of two changes of ownership in the 15-year life of the plant. The average age is 35. About half the number is technician grade and seven per cent are graduates.

The plant uses a number of automated processes including numerically controlled and multiple drills, programmable component sequencing machine, automatic insertion of chips and discrete components and automatic backplane wire wrapping.

Names on these machines include Graziano on the NC drills, Plurima on the multiple drills, Behrens on the punch presses and Gardner Denver on the wire wrap machines, but several automated processes have been developed by the company and based on the last product line, the G100 series computers. Four are used, for example, on backplane testing and component sequencing.

Current development involves using Level 62s in the automation process and for a terminal network providing online information.

Customers in manufacturing industry already use Level 62 in their internal networks, the biggest being Olivetti and Fiat. In fact manufacturing industry is the largest user of Level 62, accounting for 37% of Italian installations. Next largest groupings are finance, distribution and central and local government.

HISI is the only computer firm in Italy fulfilling all the supplier functions of R&D, manufacture, marketing and service. It counts over 2,000 general purpose computers installed and maintained. This is 70% by number and 22% by value of the Italian total and second only to IBM.



The assembly line for dot matrix serial printers at Honeywell's Caluso factory, near Turin.

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Spain is soon to become a serious contender in the DP stakes. But rather than taking on established markets in Western Europe and North America, Spain is looking to the Middle East, Latin America and Eastern Europe. Here Ivan Berenyi spotlights the activities of Secoina, a consortium financed by the Spanish

government, the telephone company, banks and a local components manufacturer.

Set up three years ago by government decree, its brightest spark is the Series 30 computer system which is aimed at the same market segment for which the IBM System 3 and the ICL 2903 were designed.

Spain bids to set up its own DP industry

By Ivan Berenyi



The Secoina Series 30/5, a small business system (left), and Telesincro's Series 10/4 which also appears under the Secoina label as the DF-4.

THE opening of a purpose-built factory in Malaga by the Spanish company Secoina later this year will mark a new step in Spain's attempt to establish a viable indigenous computer industry.

The factory, on the Guadalquivir industrial estate, will be making the Series 30, a small business machine, and the scientific/industrial Series U models, as well as a range of terminals and modems.

Both the Series 30 and the process control-oriented Series U have been designed for Secoina by the Japanese manufacturer Fujitsu, which has a 28% stake in the company, making it the largest single shareholder. Other main shareholders are the Spanish industry ministry through its Instituto Nacional de Industria, INI (analogous to the UK's National Enterprise Board) and the telephone company CTNE. Both hold 25% of Secoina, the balance being made up by nine Spanish banks and local components manufacturers.

The Series 30 is the brightest spark of life yet shown by Secoina — an acronym for Sociedad Española de Comunicaciones e Informática — since it was created by government decree three years ago.

Now the first fruits of the government's policy are beginning to emerge. Last year saw the introduction of the Secoina 35, a disc-based minicomputer from the Fujitsu design stable; the Series 30, designed to compete in the IBM System 3 and ICL 2903/4 sector, will go into production late summer or early autumn; and the Series U, about which little is so far known, will follow next year.

The relationship between Secoina and Telesincro is confusing. Officially they are merged, with Secoina holding a 67% stake in Telesincro — the minimum controlling interest under Spanish fiscal law. But some effort is being put into preserving the separate identity of Telesincro, for legal and tax reasons Secoina says.

The result is that the majority of employees, including almost all sales staff, are still contracted to Telesincro and paid from Barcelona, though they are expected to handle products bearing either name. Only staff hired by Secoina since the merger are strictly employees of the parent company.

"We all belong to the same group — it's just one company with two names," explained Señor Juan Carlos Montero Vargaa-Zuniga, Secoina's director with responsibility for exports.

Nevertheless there are signs that rationalisation is not yet complete. The Series 10/4, cur-

rent model in a family of small business systems designed and made in Barcelona under the Telesincro name, also turns up as the Secoina DF-4 — something that image-conscious Spanish customers find puzzling.

Geographical factors cannot have helped in the merger so far: the group's two manufacturing locations could hardly be further apart. The Telesincro operation is based on a plant in Barcelona's Calle Rocafort, employing about 550 people; Secoina currently occupies a temporary building in Malaga, employing 95, while it awaits completion of its new factory in the same city. Group headquarters are in Madrid, about equidistant between the two plants. But this apparent initial drawback is intended to be turned into an advantage, in due course, in building up a dense network of sales and service locations nationwide.

The Secoina plant in Malaga currently makes only terminals and modems, but because the opening of the new factory has been delayed it is likely that production of the Series 30 will start in the temporary building and be transferred towards the end of the year.

Two ranges of terminals are made in Malaga — stand-alone banking terminals and simple keyboard machines. The influence of the Secoina shareholders is apparent, the banks being a captive market for the first product line, and CTNE a major customer for the second.

The modems — 2,400 and 4,800 baud machines — are also largely destined for CTNE, which will lease them to telecommunication users of its Red Nacional national data transmission network.

Production at Malaga started last July, and by the end of the

year 40 banking terminals and 1,200 modems had been built. Target figures for the first six months of 1978 were set at 80 banking terminals, 1,300 modems and 150 keyboard terminals.

By the end of 1979, ambitious target figures are 3,200 modems, 200 bank terminals, 300 keyboard terminals, 300 online teller terminals for banks, 200

Series 30 has a 670 nanosecond LSI main memory expandable from 24K to 224K bytes. This is backed up by virtual memory configured in 512 byte modules.

Microprogrammed modules are said to be available for a number of control, scientific and communications applications. The operating system is called Unios/F2, and the machine can be programmed either in Cobol

Until recently Secoina was scarcely more than a layer of bureaucracy imposed upon the old Telesincro company of Barcelona.

France's Plan Calcul provided the original inspiration for the setting up of the company and, somewhat oddly perhaps, the creation of Cuba's Centro de Investigacion Digital. The prime propagator of a Plan Calcul-type approach was Señor Claudio Grino Ramos (pictured left) a pharmacist who had been nominated Consejero Director General of Telesincro in 1973, but has since left the Secoina fold.

Secoina Series 30 computers and 110 Series U machines.

Brochures are already in circulation among potential Spanish customers for the Series 30, although the first machine has yet to be built. Neither Secoina nor Fujitsu is keen to talk about the origin of this system, but it appears to be a new development for Secoina rather than an adaptation of an existing Fujitsu machine.

According to the brochure the

or Fortran as well as a low-level language called Taskforce.

Peripherals for the Series 30 will be made in Barcelona and include a 243K byte diskette (almost certainly the same units that are currently supplied for Telesincro's Series 10/4), up to 320M bytes of fixed-head or exchangeable disc storage, 282K byte magnetic tape units, 800 bpi cassette tapes and a series of printers from 45 cps to 340 lpm. A choice of keyboard/

printer or video terminals will be available, the terminals to be made in Malaga.

The System 30 will join the similar but smaller System 35, Telesincro's existing Series 10 minicomputers based on a 32K to 64K RAM with a limited choice of peripherals including cassette tape, low-speed printer, file unit and — at maximum configuration — diskette) and the Telesincro Iber 2, a database-oriented minicomputer designed for online applications like stock control and small-scale reservations systems.

The Iber 2 which Telesincro's latest adverts say is "the machine that converses in Castilian," is the Catalonia-based company's newest model in the long-running "Factor" range; itself launched in the "15 Simi" exhibition in November 1975, its earliest predecessor was the Factor P, first marketed in 1967.

The P was followed by the Q, R, S, S3000 (in three configurations), T models and the Castor Series of the Factor line.

Of the Secoina Series U little is known except that it will serve real time needs and will be available in four configurations from U-100 to U-400.

Secoina's development programme is clearly bottom-up rather than top-down, which is realistic in view of its lack of direct government support and the competition from IBM, Univac, Fujitsu itself, Honeywell, Bull and, increasingly, ICL.

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"Of the four initial countries, Mexico and Argentina have the highest technical level. In Chile we have good contacts and in Venezuela there is plenty of money but not so much technical sophistication."

But the company is also looking south and east. Three Arab countries — Egypt, Iraq and Algeria — are to be used as pilots for a Middle Eastern and North African export presence.

Secoina is currently studying the possibility of setting up a joint Spanish/Egyptian regional HQ in Cairo to provide sales, systems support and maintenance. This, Montero felt, would help overcome the language problem which might otherwise be prohibitive. In Eastern Europe, which Montero considers another area of potential interest, initial co-operative talks have taken place with the Soviet Union.

Western Europe is to be ignored though. "The European market is too strong, and to break into it needs too much investment in our terms," Montero conceded.

"We have not even given a serious thought to official participation in events like the Hannover Fair or Sigco, albeit some of our people from the R&D and product divisions tend to go to these local events. We are not interested in Europe outside Spain and Portugal, we prefer to invest all our efforts

in 1973 but has since left the Secoina fold.

Today export director Juan Carlos Montero warns against drawing too close a comparison between the Secoina effort and Plan Calcul. "Secoina is a private company, not a government-sponsored outfit," he pointed out. "OK, there is a partial government ownership through INI, but even if you put the holdings of INI and CTNE together, they come to less than 60% of the total."

"We are in the same position as any other computer products supplier in Spain. There are no import duties levied on computer manufacturers here, so we have to compete on equal terms with the IBMs and Univacs. Our prices have to be very competitive."

Last year the group's turnover of domestic sales was around £6 million. In addition there was some export activity to Portugal, where Secoina has a sales office.

Secoina's commitment to exporting is firm but selective. "As a Spanish company, we obviously enjoy linguistic and other advantages in Latin America, and this is our prime export orientation," said Montero.

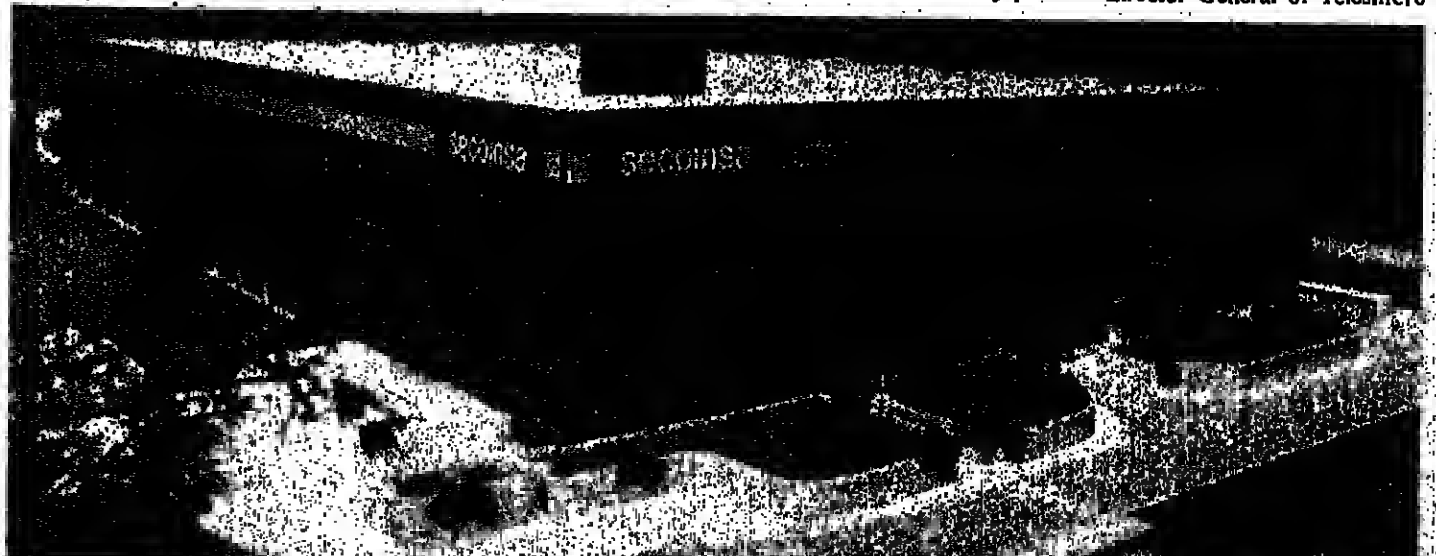
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A model of Secoina's purpose-built factory in Malaga, due to be opened later this year.

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Automatic insertion of components on printed circuit boards (bottom right) at Caluso.

The development of distributed processing and terminal networks has resulted in the introduction of a wide range of systems and hardware designed to meet users' needs. Most minicomputer manufacturers, minicomputer companies and many systems houses

have moved into this expanding market and much of the equipment now offered is, inevitably, IBM-compatible. Now, however, a new challenge is on the verge of becoming a reality in the form of AT&T's proposed Advanced Communications System which,

when it gets US government approval, will offer as a service most of the processing facilities that are now handled by communications processors and front ends. Hara, MORRIS EDWARDS (right) looks at the systems and considers possible impact of ACS.



AT&T system challenges the front-enders

services as well as store-and-forward message switching services such as OnTymes, introduced by Tymnet in May, 1977.

Likewise, the use of communications processors as data concentrators is threatened by the increased capabilities of the less-expensive intelligent time division multiplexers.

Through the intelligence added by these devices, smart multiplexers are able to provide the statistical multiplexing, error control and networking capabilities of concentrators at a much lower cost and without impacting host and front-end software.

Of all uses for communications processors, the front-end continues to be the most popular, and its future seems the most assured. Today, users have a broad choice in front ends. They can look to their mainframe supplier or to a group of companies which offer plug compatible equivalents (generally for IBM systems). Alternatively, most minicomputers can be programmed to operate as front-ends.

According to Creative Strategies of San Jose, California, IBM accounted for almost 40% of the installed base of front-end processors in 1976. Other mainframe competitors, including Honeywell, Burroughs, Control Data and Univac, were also doing well in the communications processor market. Digital Equipment, Data General, Modular Computer and Interdata were the leading minicomputer suppliers, and Collins and Comten the most successful of the independent suppliers.

Since then, NCR has made gains among mainframes, Hewlett-Packard has become

more aggressive in the data communications arena and Mamorex and Computer Communications have had success as independent suppliers of front-end processors.

IBM blessed the concept of the programmable front end with its introduction of the 3705 in 1972. This device comes with its own programmable processor and can operate either as an emulator of the hardware 270X family or as a true front-end, unloading communications functions from the CPU under the Network Control Program.

A later introduction by IBM is a scaled-down version of the 3704, which handles fewer lines and costs less. One major drawback with the 3705 is that it does not support local peripherals, which precludes its use for certain front-end applications, such as message switching or data acquisition, both of which require discs or tapes for message storage. Also, without peripherals, the front-ends cannot serve as a back-up processor should the host fail.

Even so, the importance of the 3705 was set in 1974 when IBM included it as an integral part of Systems Network Architecture. Within SNA, a data communications network comprises the host System 370 and 370X front-end processor, and a variety of general and special purpose terminals.

Since then, IBM has upgraded the 3705, lowering its price and boosting its speed and throughput with semiconductor technology. The 3705-II can provide up to six times the high-speed communications throughput of the 3705-I, and leases for roughly half the price. Also, the front-end's networking capabilities were enhanced with IBM's in-

troduction of Advanced Communications Function software in late 1978.

With this software, any supported terminal can access an application in any computer in the network. Another new feature enables the 3705-II to be used as a remote communications controller, concentrating data from multiple communications lines before transmission to a 3705 attached locally to a computer.

Other mainframes have also included front-ends in their network architectures. Honeywell introduced the Datatrac 6678 front end in early 1977 as part of its Distributed Systems Environment. Meanwhile, in announcing its Distributed Communications Architecture, Univac unveiled a Distributed Communications Processor, which can serve as a front-end, remote concentrator or network mode processor. Included with the architecture is an intelligent network communications system, called Telcon, whose major components are the communications processor and network software.

Control Data uses a communications processor as the basic building block of its Distributed Network System. NCR is another mainframe which also uses a communications processor as a key element of its Distributed Network Architecture. Minicomputer firms tend to emphasise the general networking capabilities of their products and prefer to sell a system rather than a single network component such as front-end or concentrator. Even so, the minis find common use for front-end processing, thanks to

the packaging efforts of systems houses. For instance, Action Communication Systems of Dallas uses a Data General minicomputer to power its Telecontroller, which is used as a message switch and front-end in over 60 installations.

Among recent networking developments with minicomputer suppliers, Digital Equipment has enhanced its DECnet software and Hewlett-Packard has demonstrated the resource-sharing capabilities of its HP 3000 as part of the Project Prelude experiment conducted by Satellite Business Systems.

The HP 3000 system allows users to link any number of computers into data processing networks. What the experiment demonstrated was the ability to configure an HP 3000 network with each computer capable of automatically drawing upon files, programs and peripherals of other 3000s, no matter where they are located.

Digital's Phase II DECnet software products have cleared the way for intercommunications between most of its major operating systems and computers, ranging from the LSI 11 microcomputer at the low end to its recently announced 32-bit VAX/780.

Date General's minicomputers are widely used by systems houses, and the firm also sells its machines to technically skilled end users. Recently, Modular Computer Systems unveiled the first members of a new family of computer systems that includes a communications processor capable of providing a multiplexed direct memory data path for up to 256 full-duplex lines. Each communications line is controlled by its own special

character algorithm, enabling detection to be performed in hardware. The individual algorithms are dynamically definable software, providing the flexibility to accommodate changing terminal environments.

Of the independent suppliers of plug-compatible front ends, Comten has made the biggest splash with its Comten Network Architecture, a combination of software and hardware designed to compete with IBM's SNA. CNA is implemented with Comten 360X processors containing the firm's Network Control Program.

Also part of CNA is a software system called Data Switching System, which provides data switching services and facilities for distributing network management and communications processing in networks. In addition, there is a complete system of programs and procedures called the Communications Networking System, which is used to interconnect Comten 360X front-end processors and remote concentrators in a data processing network.

With its hardware Model 1270 Terminal Control Unit, Memorex was one of the most successful suppliers of 270X plug-compatible units. In late 1975, it supplemented the hardware with a programmable communications processor, the Model 1380, which is a functional replacement for the 270X and 370X controllers.

Computer Communications is another leading supplier of plug-compatible processors. Its CC-80 communications processor replicates 270X or 370X controller functions using IBM telecommunications processing software. The processor includes a CNA designed, 10-bit minicomputer with 128 hardware registers at the central controller. A separate input/output processor, as powerful as the CPU, can handle up to seven host computers, plus remote terminals.

As a possible alternative to these front ends, AT&T plans to perform functions as part of its ACS service. The processing functions will be performed by local computer-based nodes installed in Bell facilities around the country.

Beside handling the processing chores, the nodes will assemble data into packets, improve efficiency and route them to their destinations. Users will access the nodes via a change equipment on a local premises. As part of a package, Bell will also provide a high-level language called Feature Definition Language, so that users can program their node-based applications.

Potentially, it could give greater choice to users in implementing their data processing networks. In any case, AT&T's communications service is a powerful competitor to the minicomputer suppliers.

ROUNDUP

NATO is to place giant software contracts

MAJOR software companies in Europe and the US are preparing to bid for some of the biggest software contracts ever placed. The customer will be NATO. A call for bids is expected to be made soon for a study contract which alone should be worth about \$8 million.

The main contract will involve a network of command and control systems covering European member countries and linking them with the US. In preparation for this NATO is converting its integrated communications system, NICS, to digital. The principal contractor for conversion of ground stations and supply of all-digital stations is US motor giant subsidiary Ford Aerospace and Communications Corp, and the major sub-contractors are Marconi Spica and Defence Systems, Messerschmitt-Bolkow-Blohm of West Germany and Ege Europa of Italy. (CW, May 18 and July 8).

CLAIMED to be the fastest 16-bit minicomputer on the market, the new Hewlett-Packard HP-1000 F-series was announced in April. HP has also announced price cuts of up to 38% on memory for the earlier HP-1000 models. (CW, April 27).

CONTRACTS have been awarded by the US Department of Defence to CIL-Honeywell Bull in Paris and to Intermetrics Inc of Cambridge, Massachusetts to continue work on a common high-order language for embedded computer applications, with the aim of delivering compilers in 1979. (CW, April 27).

DUTCH Philips has taken a major stride in the word processing market with the acquisition of about 80% of the Montreal-based company Micom. The latter's floppy disc-based system, which is built around the 8080 micro, will retain the name Micom in North America but in Europe the system will be given a Philips house identity and launched as a complement to the WP5001. (CW, May 4).

AN investigation by IBM revealed that over-enthusiastic Japanese salesmen had been giving potential customers advance information on the company's forthcoming E-series, which is to replace the lower end of the 370 range. Apparently the salesmen were telling customers that the new line would be announced shortly, and that it would offer double the performance of the existing 115 and 125 at about the same price. (CW, May 4).

PLANS for co-operation between the EEC and Indian companies in several areas of the computer industry were outlined in a joint memorandum signed in Delhi in April between the Indian government's Electronics Commission and representatives of EEC computer and software companies (CW, April 20).

THE European Association for Software Access and Information Transfer, EAST, which recently celebrated its first birthday with a conference in Paris, has devised a new method for the classification of technical software products. The method is a compromise between the one-dimensional approach and the keyword system. (CW, May 4).

ADDITIONAL joint ventures between Control Data and the Roumanian government are to be established, but CDC chairman William Norris blames the US government's export policy for the poor performance of the existing Romcontrol Data venture, which builds printers and other peripherals. (CW, May 11).

A COMPLEX series of agreements between US multinational Litton Industries and the West German Diehl group will result in Litton subsidiary Triumph Adler acquiring the Diehl Daten-system company, which makes and sells very small computer and office systems. In return, Diehl group will get 12.8% of Triumph Adler's parent, Triumph Werke Nürnberg, with an option to increase this to 25%. Triumph Werke was 88% owned by Litton. (CW, May 11).

A SUBSIDIARY of Philips has entered the IBM plug-compatible CPU market. The company is Two P Co Inc of Sunnyvale, California, and the machine is the Two P/V32, described as a 32-bit minicomputer.

A summary of main news items which have appeared since the last full issue of Computer Weekly International.

Medical conference

THE recently-formed European Federation for Medical Informatics will hold its first conference at Cambridge, England on September 4-8. It is organised by the medical specialist groups of the British Computer Society. An important part of the conference will consist in introducing medical computing to doctors, nurses and health administrators who have no prior knowledge of the subject. More than 200 papers will be presented over the five days, and there will also be a small exhibition of equipment. Further details can be obtained from Online Conferences, Cleveland Road, Uxbridge, Middlesex, England, tel: 88 35262.

THE British government's National Enterprise Board has established a multi-million investment plan to set up a British company making 64K bit random access memories (CW, June 1).

A SUBSIDIARY of the UK government's National Research and Development Corp, Compeda, has set up its own subsidiary in the US, with offices in New Jersey and San Francisco, and is to form a company in Holland. Compeda was formed to market world-wide software developed in the UK for high technology applications. (CW, June 8).

THE Dutch PTT has bought a version of the UK Post Office's Prestal videodata software and 4080 minicomputer from the UK company GEC. (CW, June 15).

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Boom or bubble in the IBM-compatible market

● from page 31

IBM 303X processors, their place has been quickly taken by other IBM users who want the earlier deliveries that Amdahl and Intel offer.

Operating system software available on the compatible processors may, however, diverge increasingly in the future from that offered by IBM on its own 370 and 303X processors, as it already does on Siemens/Fujitsu M systems running under OS/VS-F4 and on CSS 3200 systems running under VSE/SS. IBM has begun a policy of charging both its own and compatible system users for extensions, such as MVS/SE, and of embedding the core routines of such extensions in microcode to improve throughput. Some

compatible processor manufacturers may decide not to provide matching microcode for many of these extensions, as Amdahl has already decided in the case of MVS/SE.

This divergence will only be of concern, however, to those IBM users who accept wholeheartedly IBM DP Division's philosophy of maximum centralisation of data processing, and therefore feel obliged to install every new IBM OS release and upgrade when it occurs. Such users will probably wish to stick to IBM hardware in any case.

A growing number of IBM users appear to think so because there are still a large number of 360 installations in the field, whose users refuse to be converted to 370, and an equally large number of 370 users who have not yet imple-

mented a VS operating system. No more than 30 per cent of large 370/148, 158, 188 and 303X users are yet believed, by one market observer, to have implemented or considered implementing OS/MVS.

It is to these "stabilised" IBM users that the compatible processors will appeal primarily, as the most compact and cost-effective method of equipping themselves with additional processing power without disturbing their operating environment.

Companies planning to distribute part of their processing to remote offices and factories must, however, also pay particular attention to the quality and speed of response of the maintenance engineering support available at each location. Few rival distributors of com-

patible processors, if any, will be able to match the IBM customer engineering service in this respect.

The IBM-machines code compatible processors can thus appeal to only some IBM users: those with installations in a main industrial and commercial area where office floor space may be at a premium, with a stabilised operating environment that they do not wish to enhance significantly in the future, and with enough self-confidence to be willing to look at alternative suppliers.

Those manufacturers and distributors already present on the European market seem solid enough. Amdahl, which has now conquered some 15% of the large IBM-compatible processor, 370/148 or greater equivalent power, installed base worldwide, and

Intel, veteran survivor of the leasing company PCMC peripherals and memory market shake-outs.

In the long term, new components and system architectures in the 1980s will make both current IBM 370 and 303X and their independently manufactured compatible rivals equally obsolete. Rumours from within IBM indicate that the new relational database management system now under development, and all the advanced DB interrogation and manipulation languages that will go with it, will not be made retroactively available to 370 and 303X processors but reserved to the new H series to be announced in 1980, or after. Amdahl, Intel and other compatible processor users will be worse off. Sufficient unto the day the problems thereof.

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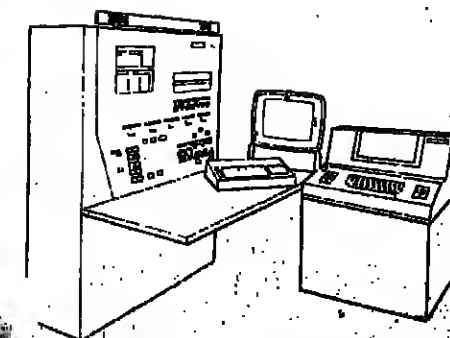
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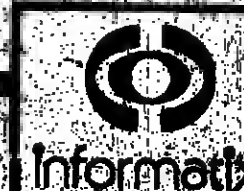
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Interviews will be arranged at a mutually suitable location either in London or Overseas. It is anticipated that the successful applicant will commence employment by October 1978.



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London WC1X 8HR
Telex 299539 Haven G

best in class

EUROPE'S LEADING SPECIALIST RECRUITMENT CONSULTANTS

MICRO-COMPUTERS EUROPEAN PRODUCT MARKETING MANAGER

OUR CLIENT IS UNQUESTIONABLY ONE OF THE WORLD'S LEADING SEMI-CONDUCTOR MANUFACTURERS, WITH AN UNRIVALLED RECORD OF TECHNOLOGICAL DEVELOPMENT AND INNOVATION. THEIR EUROPEAN GROWTH IS EXCEPTIONAL AND THEY NOW WISH TO APPOINT A PRODUCT MARKETING MANAGER FOR THE EUROPEAN MARKET. IN ADDITION TO A HIGHLY ATTRACTIVE INCOME PACKAGE, THE POSITION OFFERS —

EXCEPTIONAL CAREER PROSPECTS

The growth rate and opportunities are probably without parallel. Our Client is a leader in the development, manufacturing and marketing of semi-conductor products. Not only does this provide an outstanding professional challenge but perhaps also the greatest security.

INCOME AND FRINGE BENEFITS

The position is of major importance and our Client will establish a compensation and benefit package which recognises the importance of the position.

EXPERIENCE REQUIRED

a. Several years in the semi-conductor or mini-computer industry, ideally in a product marketing and sales environment.

b. A solid technical background, particularly in the field of micro-computers and systems architecture.

c. Personal flexibility that allows for travel and possible initial relocation.

d. The ability to communicate effectively at all levels within the Company and with European Clients.

e. Fluency in at least one major European language, additional to English.

This position requires a mature and business-minded person, who is experienced and confident in the design and implementation of international marketing policies, both in the short and long term. A thorough understanding of the wider European business environment with its national differences is essential.

If you feel that you can meet these requirements, we would like to hear from you. Send your résumé to DPSC GROUP LIMITED, CROWN HOUSE, MORDEN, SURREY, ENGLAND or TELEPHONE LONDON 540 8311.

YOUR APPLICATION WILL BE TREATED IN THE STRICTEST CONFIDENCE — THAT IS OUR BUSINESS.



Crown House Morden London SM4 5EU

consultancy division

01-540 8311

24-hour answering service

CONTRACTS

We currently have the following challenging opportunities both in the U.K. and overseas. If you can't see anything here that suits you, don't worry. We have many more equally interesting positions which may be just up your street

Honeywell 68 Cobol TOS &/or IDS	IBM 370 PL1 QOS & OS	PDP & Micro Assembler
IBM System 3 RPG 2	PDP Corel 68 RSX11	U 8000/1100 Cobol
ICL 2903 Cobol	IBM 370 Cobol OS	Systems Analysts & Project Leaders

For more information about these and other contract requirements get in touch with Stephen. Write him at: Stephen, DPSC Group Limited, P.O. Box 74, Brentwood, Essex. CM11 3BZ. London No. 540 8311.

MYRIAD APPOINTMENTS LIMITED

Computer Personnel Consultants

DP RECRUITMENT CONSULTANT

FLEET STREET

1st year c£7,500

An outstanding opportunity exists for an additional recruitment consultant within the Myriad organisation. The successful candidate will work within a fast moving environment and be responsible for challenging recruitment campaigns on behalf of major organisations covering a wide range of data processing issues. Applicants should have a background in commercial programming or analysis coupled with good communications skills. They should enjoy dealing with people and have experience of client oriented situations would be a distinct advantage. The Company offers excellent conditions of employment and first-class career prospects to the successful applicant who can expect an initial salary of c £7,500 in the first year rising to an estimated salary of £9,000 to £10,000 in the second year of operation.

Ref. A1/1300

24-hr. answering service.
Please telephone for a confidential
discussion or write to:
30 Fleet Street London EC4Y 1AA
01-363 0801

LANCASTER POLYTECHNIC

Faculty of Applied Sciences
Department of Computer Science

Lecturer II in Computer Science

The successful applicant will be expected to contribute fully to the work of the Department in all aspects. Recent practical experience (and/or previous teaching experience) in Systems Analysis, Systems Design, and Systems Programming is essential.

Salary Scale: Lecturer Grade II — £4,101-£5,559 per annum (inclusive of superannuation).

For application forms and further particulars apply to the Director of Studies, Faculty of Applied Sciences, Lancaster Polytechnic, Bailrigg, Lancaster LA1 4YW.

BREATHERS GLASGOW HEALTH BOARD

Systems Designer

£4,950-£6,000 per annum

Applications are invited for the above post in the Board's Computer Centre which is located at 27 Park Circus, Glasgow.

The successful candidate who should have 4 years' relevant experience and preferably possess a degree or equivalent qualification in computing business shall be required to share and when appropriate supervise the work of systems staff engaged in the creation and maintenance of computer systems for application in the financial and health services fields.

Application forms and job descriptions may be obtained from the Personnel Officer, Glasgow Health Board, 27 Park Circus, Glasgow G3 7PU.

Chief Programmer

PO1 (6-10) £6,513-£7,230 p.a. including supplement

An experienced Programmer is required to join the Programming Section. Applicants should have 4 years' experience in computer programming, preferably in COBOL, including supervisory experience. Local knowledge would also be an advantage.

The County Council run an ICC 1904S (12000) due to be changed for a considerably larger machine in 1980.

When applying applicants should state their preference for the post.

Application forms are available from the Personnel Officer, County Hall, George Row, Northampton NN1 1PA. Telephone Northampton 3443 and 3444. Forms should be returned by 27 July 1978.

Northamptonshire
Treasury & Personnel

Data Control Supervisor

Up to £5,000 pa including
shift allowance London E.15

In anticipation of expansion and an increased workload, our clients, a major international bank, have recently installed an IBM 370/138 and are planning to replace their existing 370/135 with a 370/148.

As the planned upgrade of hardware would suggest, the environment is rapidly developing and a Data Control group has recently been established, which requires an experienced supervisor to get to grips quickly with implementing the 'control' element of this function.

Candidates should preferably have in-depth supervisory experience in data control, especially in computer scheduling and library duties. A shift system is in operation, for which a shift allowance of £550 pa is payable.

In addition to a competitive salary, there is an annual bonus of up to 8% of basic salary rising to as high as 15% after two years, a low-cost mortgage scheme, currently 3%, plus other excellent benefits, which include interest-free season ticket loans and subsidised lunches.

Write enclosing n.c.v. or telephone for an application form 01-262 0181 quoting reference CRS/BU.

L. Duskwick Esq. (REF: CRS/BU), Lockyer Bradshaw & Wilson Limited, North West House, 119/127 Marylebone Road, London NW1 5PU.

LBW

LOCKYER, BRADSHAW & WILSON
LIMITED

Which operating system is IBM investing in? The answer is, of course:

MVS-3031

Now is your opportunity to move forward with the times into the MVS environment.

Avi is the acknowledged world leaders in vehicle rental and we are installing an IBM 3031 at our European Headquarters in Bracknell. This will be linked via private telephone lines to terminals and mini computers in many European countries. This development requires:

Shift Leaders c£5,800
Operators up to £4,800

All candidates must have experience operating large IBM mainframes under OS, the operators for a minimum of one year and the shift leaders for a minimum of two years. In addition the shift leaders must have six months relevant supervisory experience and a sound working knowledge of OS JCL.

Salary and job prospects are excellent within our expanding Systems Department, with opportunities for career progression either in computer operations or programming and systems development.

The company offers a non-contributory pension scheme and subsidised staff restaurant as part of the benefits package. Rented housing may also be available.

AVI ARE ABLE TO OFFER A UNIQUE OPPORTUNITY FOR THE SUCCESSFUL CANDIDATES TO BECOME ACTIVELY INVOLVED IN THE PRE-INSTALLATION PLANNING OF THE 3031 WHICH WILL BE OPERATIONAL IN DECEMBER 1978. THESE POSITIONS MUST BE FILLED NOW, SO ACT QUICKLY.

Avi House is situated within easy access of the M3 and M4 Motorways and is convenient to Bracknell Railway Station on the Reading to Waterloo line.

For an application form or further details please write or telephone Colin White, Computer Operations Manager, Avi House, Station Road, Bracknell, Berkshire RG12 1HZ, telephone Bracknell 26644, Ext 251.

AVIS

Management Services



Data Processing Recruitment Consultants

Project Manager Middle East

Salary: £1,350 per month (Tax Free)

We are retained by a U.S. consultancy to recruit a Project Manager offering an in-depth knowledge of Data Base and Teleprocessing techniques in an IBM 370 environment. The successful candidate will be required to co-ordinate and manage the implementation of computer systems; develop a computer applications training department and co-ordinate inter-departmental liaison.

In addition to a tax free salary, the Company offers a 35% regional allowance, free furnished accommodation and financial assistance in the purchase of a car. We can only take applications from those who will consider a BACHELOR posting.

Ref 18/A

The Creative Alternative Netherlands

Salary Range: c. £10 - 15K

Our client built their success on people and their ideas. They believe there's only one kind of job. The kind where people become highly involved. With their work. With each other. With ideas. Where new solutions are respected and encouraged. Where your co-workers are competent, stimulating and genuinely interested in their work, too. Our clients are currently seeking creative individuals to join one of their specialist project teams at

various levels from Consultants through Team Leaders to Applications Programmers. A Mini computer Real-time background is essential. Programmers must be well versed in Assembler and senior posts could benefit from a Degree or equivalent in Maths or Computer Science. Contact us soon; when you see how our clients run their organisation, you'll understand what we mean by 'The Creative Alternative'.

Ref 18/B

DECNET or X.25 London or Copenhagen

Salary: £12 - 17K + Outstanding Benefits.

When it comes to State-of-the-Art Real-time Mini Software our client deals to no one. They are internationally regarded as 'technical frontier pushers' and as a valued project-team member you will share their prestige and acclaim. To meet a continuous phased growth programme our client is establishing several new project teams requiring Consultants, Project Leaders, Analysts

and Programmers. The latter will be well versed in Assembler and the former will either be graduates or have extensive relevant experience in lieu. Willingness to re-locate for a meaningfully extended period to one of the most desirable E.E.C. locations is important. Every assistance will be given to candidates and their families in re-location. Interviews and offers will be made during July.

Ref 18/C

Systems Engineers + Programmers Brussels + Home Counties

Salaries up to £14.5K (EEC), £8.5K (UK)

An internationally renowned supplier of Data Base and Teleprocessing management systems requires for its Belgian and U.K. operations several Systems Engineers and Programmers up to Consultant level. You should have current experience in the implementation and support of Data Base and/or Real Time systems. Additionally, there is a requirement for the U.K. staff to travel within this country and occasionally to the E.E.C. Candidates for the Brussels position should ideally

(although not essentially) have French language ability. Supplemental to a high salary you will receive extensive benefits including full relocation expenses, life and disability insurance, pension plan, overseas allowances and liberal mileage allowances. Above all, these positions carry excellent prospects. Interviews will take place within fourteen days of the appearance of this advertisement.

Ref 18/D

Analysts + Programmers Manchester

Salaries: c. £5 - 9K

Our client is a major international company recognised as market-leaders in their field and has retained Logistix to assist in recruiting the following key project-team specialists: Real-time mini programmers, Data base designers and communications experts (Mini and Mainframe). Application and Software programmers. Experience of any of the following will be especially welcome: RSX 11, RT11, BASIC, ASSEMBLER, PL/I, COBOL, IMS,

and D.B. For those who enjoy overseas travel there will be ample opportunity to visit European and Middle East locations at which our clients have offices. Successful applicants are likely to demonstrate qualities of leadership, potential, determination and be self-starters. It is anticipated that you will achieve very rapid promotion within this prestigious company.

Ref 18/E

Logistix, Freeport 32, London W1E 3YZ
01-491 4636
(Reverse charges)
Telex 28800



Avon House, 366 Oxford Street, London W1N 9HA

20 July 1978

MARKETING DIRECTOR

BRISTOL £12,000 + bonus + car etc

Systems and Software

A multi-million pound computer services company has progressed to an advanced stage in establishing its own system and software design and hardware installation subsidiary. A significant volume of sales has been achieved by the nucleus staff and it is now appropriate to engage a senior person to direct and lead the expansion programme at the highest level.

The successful candidate must have a wide knowledge of the business systems market, particularly within the mini-computer sector and a technical appreciation of these systems. Above all the ability to actively engage, advise and manage a sales force of up to 10 covering the southern half of the U.K., is keenly sought. In return for your skills and commitment you will be offered not only a substantial salary in the order of the above figure, a car and significant bonuses for achievements but an additional share of the company's profits. This is a superb opportunity to be closely involved with the growth of a business and to control your own career path in an interesting and energetic environment.

Telephone Bill Seymour on 01-637 5001 for initial discussion and further details.

Western Europe Holland

Software £8,500 - £16,000

We are actively recruiting programmers, analyst programmers, Consultants and Senior Consultants for career appointments in Western Holland. The environment you will encounter is one where high quality software design and implementation is essential, and it is important you wish to be involved professionally with individual customers' systems. The company is already established as a leader in its field and expansion planned is considerable throughout Western Europe.

We are particularly interested in career-minded people who have had experience in an on-line, real-time environment, or switching or networks using mini-computer based systems. Projects you will encounter will be extremely varied, often extensive and usually sophisticated.

Successful candidates can expect a competitive continental salary (generous tax concessions can also be applied for), interesting and worthwhile job content, excellent conditions of employment and benefits associated with a prestige company.

Telephone me, Bill Seymour, for further details; interviews with our client will take place in London at the end of July.

Bill Seymour 01-637 5001

U.K. Office, Portland House, 4 Gt. Portland St., London W1N 5AA
Andrew Ellis, Serphatistrant 30, Amsterdam, Holland. Tel. (020) 284684

Accord Computer Efficiency

SEDGWICK FORBES GROUP

International Insurance Brokers



Are you a D.P. professional looking for a new challenge?

Then one of these two unusual senior appointments, offering excellent career prospects, is right

for you. A strong D.P. background is essential, and you must be ambitious, positive and a self-starter.

PROGRAMMER TRAINING OFFICER

You will have the responsibility for developing and running a school for trainee programmers entering the Group Systems Services Department. Additionally, you will assume responsibility for co-ordinating all programmer training covering -

Languages (BAL and PL/I)
Teleprocessing (IMS and 3790)
Database (DL/I)
Programming Aids (IPT & TSO)
Operating Systems (VS/I and MVS)

Whilst a flair for presentation would be of obvious benefit, the main qualifications required are a broad programming background and strong opinions on the professional standards required in programming.

STANDARDS OFFICER

You will be responsible for the development and ongoing control of standards within the installation, covering all aspects of the DP operation -

Analysis (from Business Studies to Program specifications)
Programming (Program design to documentation)
Operations (Operating Techniques to Installation/Data Security)
User Liaison (Procedure manuals)

You will have to be totally self-motivated with a positive approach, and at the present time will probably be actively involved in analysis. It could prove advantageous to have experience in a large IBM installation, together with a knowledge of OS.

You will be joining a large International Company at a very exciting time, with a major commitment to Data Processing. The UK installation, located in Mid-Essex comprises 3 x 370/145 operating under OS/VS1, supporting an extensive terminal network. Significant hardware and software upgrade are planned within the next two years to expand the range of applications serviced.

Your expertise is needed to create the

environment for this scale of operation, leading to a really challenging and rewarding future.

Sedgwick Forbes Group offer exceptional working conditions and benefits are in accordance with a large progressive organisation. Salaries relate to the seniority of the positions. Relocation assistance will be considered where applicable.

These are challenges not to be missed - call Paul Sullivan on 0208 69191 or write to

Mrs J. Smith SEDGWICK FORBES GROUP
Grove House Newland Street Witham Essex

FIELD SERVICE ENGINEERS

BASIC SALARY TO £5,000 + CAR

+ EXCELLENT BONUS + OVERTIME

An opportunity exists for experienced Field Service Engineers, preferably having worked with key to disk, word processing or mini equipment, to join a rapidly expanding, highly successful Computer Systems Manufacturer.

- * In depth knowledge of mini or micro processing equipment and associated peripherals.
- * A preparedness to travel both in the UK and Overseas
- * The ability to operate without supervision.

VACANCIES FOR THESE POSITIONS IN...

LONDON... READING... SOUTHEND

Contact: VAL HALL: 01-935 0671

CW/7/4

SPECIALIST COMPUTER RECRUITMENT LIMITED

SCR

BIRMINGHAM 021-236 3791
Freeport, Equity and Law House,
35-37 Great Charles Street Queensway, Birmingham B3 2BR
MANCHESTER 061-833 0427
Freeport, Blackfriars House, The Parsonage, Manchester M3 8BB
LONDON 01-935 0671
Freeport 4, 102, Blandford Street,
London W1E 1JZ

Computing
Services
Association

MYRIAD APPOINTMENTS LIMITED

Computer Personnel Consultants

POTENTIAL DATABASE DESIGNER

BUCKS

To £8,760

Due to the development of several IMS real-time applications our client is seeking an experienced Analyst or Analyst/Programmer with knowledge of database systems. Functioning in a consultancy role to several applications teams, the successful applicant will gain extensive IMS exposure, together with the opportunity to co-ordinate and influence the design and development of on-line real-time projects. Applicants should have a sound academic background, and should be capable of original and innovative thinking in relation to the design and use of database software. Experience of on-line systems, together with knowledge of data structure analysis would be of particular relevance.

The Company offers excellent conditions of employment, including five weeks holiday, an excellent starting salary and relocation assistance where necessary.

Ref. W2/1307

24-hr. answering service
Please telephone for a confidential discussion or write to:
30 Fleet Street London EC4Y 1AA
01-353 0981

SYSTEMS ANALYST PROGRAMMER

required to form part of the small highly specialised computer team at Strathclyde Police Force Control Centre 173 Pitt Street Glasgow

Salary
£3600 - £4815
including supplements
of £512 per annum and
6% of salary
Grade AP 11/11V

Qualifications
Degree or equivalent
Experience in one of the following areas:
• Minicomputers and distributed processing
• Communications systems
• On line programme techniques

Duties
The successful candidate
will be responsible to the
Installation Manager for
all programming projects
under his/her control

Application forms may be obtained from the Assistant Director of Manpower Services 21 Gordon Street Glasgow G1 3PS to whom completed forms should be returned by 27th July 1978 (Ref. G 114)

STRATHCLYDE POLICE
WORLD LEADERS IN COMMUNICATIONS



WEA WEA WEA WEA WEA WEA WEA WEA WEA WEA

SENIOR CONSULTANTS £6,500-£10,000

Six large, well-established consultancies wish to recruit systems people with self-rounded experience in third generation equipment and the right personality to deal with clients who require first-rate service. Technical communications consultants are also required where in-depth implementation experience of IBM or ICL T/P message switching networks, etc., are essential. Excellent fringe benefits and prospects.

CW 28/1 Michael

SUCCESSFUL SALESMEN To £16K quota earnings

We now have five different firms for both hardware and systems only companies who are anxious to meet successful salesmen in this industry. All firms have bonus schemes and cars or allowance. Most positions in S.E. England. Two in Midlands.

CW 28/2 Michael

SYSTEMS ANALYST/SNR S/A £6,300 to £8,200

Our clients are a famous clothing manufacturers with a major investment in O.P. Their H9000 computer is expanding and there is an urgent requirement for 2 Business Analysts who really know how to advise new departments on new systems development.

CW 28/3 Annette

USA — To \$30,000 TELECOMMUNICATION EXPERTS

Three people with hardware or software T/P knowledge are urgently required by a New York Bank. The machine experience you have is not as vital as the T/P experience itself. Phone for details and interview.

CW 28/4 Michael

OPERATORS To £5,500 inc.

Three competent people are urgently needed to work in this exciting IBM OS/TSO installation. Lots of perks and lots of money.

WEST LONDON

CW 28/5 Patricia

OPERATORS/SEN. OPS. £4,000 to £5,000 inc.

Work for an institution here to stay! All you need is 1 year + IBM OS experience. Perks include removal expenses, C.P.S. and paid overtime.

CW 28/6 Patricia

OPERATORS To £4,500 inc. + O/T

A major IBM OS/VS Power user needs operators urgently. Perks include relocation expenses, 22 days holidays, C.P.S. plus weekend paid overtime.

CW 28/7 Patricia

SENIOR OPERATORS c. £4,500 inc.

A banking organisation having a major IBM OS/VS Power installation requires operators now. Nice perks include Now C.P.S., S&S Club, Mortgage assistance and free restaurant.

CW 28/8 Patricia

FREELANCE PROGRAMMERS To £260 p.w.

PL/1 OS/DOO
H88/40 Cobol
IBM PL/1 OS
Cobol OS

Herts./City, 3 months +
Gloucester 3m. +
Holland 1 yr.
N. London 3m. +
+ Lots more

Apply NOW for the latest vacancies. IBM, HONEYWELL, DEC & ICL programs, a welcome. Earn a summer holiday paid break plus an attendance BONUS. Ask for the Contracts Officer on 01-995 5485. Iran.

RECRUITMENT Universal Computer Associates Ltd., Data Express House, 3 Prospect Place, Heathfield Terrace, Chiswick, W.4.

JUNIOR PROGRAMMERS £3,000 to £4,000

You have only 1 year's commercial experience? Then you are in great demand. We have a large selection of first-rate companies who most people like you. Some offer mortgage assistance to the right candidates after short period with them.

S.E. ENGLAND

CW 28/9 Annette

SYSTEMS PROGRAMMER £7,600

You're lucky. You could be working on one of the first 3032 installations in the country, shortly arriving. At present this major industrial user has this latest IBM 370 CICS/VS, VTAM, CMS installation. They require a systems programmer with good T.P. experience.

CW 28/10 Annette

MINI COMPUTER PROGRAMMERS £4,000 to £7,250

If you have experience in ASSEMBLER or micro-code or communications for at least 1 1/2 years then a whole exciting field is open to you. We now have opportunities in SW, NW, W, London, Surrey, Bucks and Hertfordshire for competent people in the rewarding field. The future is definitely going to be with the MINI-computer professional. Telephone for details.

CW 28/11 Michael

TIME SHARING PROGRAMMERS To £6,800

If you have had time sharing experience involving the use of FORTRAN, BASIC or ASSEMBLER, then we have four nationally known companies who would offer you an exciting job in pre- or post-sales support. Some offer generous bonus schemes.

CW 28/12 Michael

RIDE HIGH WITH THE LEADERS

★ JOB SATISFACTION

SALES PERSONS

ALL AREAS U.K.

Major world-wide organisation seeks enthusiastic/self-motivated persons with proven record in sales. Previous experience with computer or business machine manufacture an advantage. Successful candidates will be selling variety of hardware or related software to industry, commerce and local authorities. Expected earnings well into five figures. Excellent career prospects and attractive fringe benefits.

REF. 1839

SYSTEMS ANALYST LONDON

Our client, a prestigious Merchant Bankers, are seeking a Systems Analyst who has financial/banking environment experience. They retain IBM 370 under OS but will consider other hardware experience. Company offers:

★ Full banking benefits including subsidised mortgage

★ Excellent working environment

★ Job security with prestige concern

★ Salary £7,600.

REF. 1594

ICL PROGS LONDON

Due to development of their advanced computer systems, successful O.P. services dept seeks to boost its programming team. Retaining large ICL 1900 equipment they offer excellent opportunities for persons with minimum 2 years' ICL COBOL experience. Company offers:

★ Training on IOMS database

★ Development to Analyst

★ Opportunities to join at senior level

★ Applications in various areas providing an absorbing and interesting career

★ Excellent perks include flexible working hours and 9 weeks' HOLIDAYS.

★ Salary £5,500

REF. 1549

ANALYST PROGRAMMER WILTSHIRE

Our client, a major preservation society based in rural Wiltshire has vacancies for analyst programmers with at least 18 months' RPG II experience. They are involved at present in taking over all major systems from their head office and have their development work planned for the next five years. Co. offers:

★ Generous relocation assistance

★ Variety of exciting new development work

★ Beautiful rural surroundings with very reasonable house prices

★ Excellent promotional prospects

★ Salary £5,000

REF. 1537

★ SALARY

SENIOR PROGRAMMER CITY

International financial concern retaining IBM 370 under OS are seeking programmer with at least 3 years' COBOL experience. CICS would be an advantage, to become an ANALYST/PROGRAMMER. This is a superb opportunity to train in analysis in a progressive organisation. Co. offers:

★ Exciting and interesting future development work

★ Training in CICS

★ Great promotional prospects

★ Salary £5,500

REF. 1593

PROGRAMMERS MIDDLE EAST

Our client is a major international organisation with offices throughout the world. They seek programmers and analysts in BAHRAIN & JEDDAH where their market is growing strongly. Ideal applicants will have COBOL and/or NEAT experience on NCR small business machines to work on an interesting variety of projects in a financial and commercial environment.

★ Renewable one year permanent contract

★ Fully furnished accommodation provided at the company's expense

★ 30 days' leave per annum

★ Salary paid in Bahrain Dollars c £12,000 TAX FREE.

REF. 1595

PL/1 PROGRAMMERS HOLLAND

Our client, a major and successful concern, wishes to strengthen its European programming team. Retaining IBM 370 hardware under OS/VS, company seeks ambitious person with at least 18 months' PL/1 experience (COBOL would be an asset). Company offers:

★ Involvement in the development of new projects

★ Opportunity to work in an expanding organisation operating world wide

★ Centrally based — Amsterdam

★ Salary 40,000 Guilders (£10,000) + cost of living allowance

★ + relocation expenses

REF. 1935

ANALYST PROG. BERKS

International company with outstanding reputation for efficiency, growth and investment are seeking senior analyst programmers to work within IBM 370 installation. Good experience of PL/1 or COBOL or ASSEMBLER is essential together with ability to work on own initiative and supervise staff. Working on teleprocessing and time sharing systems with opportunity to work on small business machines. Company offers:

★ Exciting growth potential

★ Excellent promotional prospects

★ Non contributory life assurance, pension and sickness schemes

★ Excellent working conditions

★ Salary £5,000

REF. 1568

★ CAREER OPPORTUNITY

MINI PROGRAMMERS HOLLAND & BELGIUM

We would like to hear from computer programmers on behalf of our clients with good MINI experience. If you have at least 2 years' experience of ASSEMBLER or any mini hardware phone NOW to discuss long and short term assignments in Holland and Belgium. Co. offers:

★ Accommodation and expenses paid by company

★ Renewable assignments

★ Scope in a variety of areas

★ Salary — EXCELLENT A.A.E.

REF. 1603

SYSTEMS ANALYSTS ESSEX

Our client, a sophisticated computer and technology company, has openings for systems analyst. Retaining Honeywell 69/20 under GCOS they will take people with any hardware experience. Ideal applicants will have good business background with drive and ambition. Company offers:

★ Exciting and interesting work in up-to-date technology

★ Excellent career prospects

★ Sports and social club

★ Subsidised lunch, pension scheme plus other company benefits

★ Salary to £9,500

REF. 1595

MINI PROGS HANTS

Our client is a major British company with business interests in many areas. They seek programmers with at least 18 months' DEC POP II and BASIC + experience. This hardware is newly installed and thus offers a chance to become involved in the development from the beginning. Company offers:

★ Wide range of interesting and new projects

★ Flexible hours

★ Excellent career prospects

★ Annual bonus

★ Salary £9,000

REF. 1586

SYSTEMS ANALYST PROJECT LEADER DESIGNATE ESSEX

International company engaged in manufacturing, distribution and sales of well-known commercial products, seeks a person with design and implementation of either stock control order processing, warehousing or sales forecasting systems in an IBM environment. He or she should have the potential to control Project team developing one or more of the above systems.

★ Excellent work environment

★ Paid overtime

★ Flexi hours, 4 weeks' holidays

★ Company expansion with addition of hardware

★ Distributed processing

★ Salary c £8,500 +

REF. 1627

For details of the above positions please telephone our London office 01-734 0162/3010 24 hours

SALES PERSON

As Europe's largest suppliers of contract computer personnel to Holland, we require an additional sales person for our Amsterdam office. The successful applicant will have good computer experience preferably with a sales background. He or she will be self-motivated and keen to travel. Remuneration will include a generous guaranteed basic income, and a substantial commission. We will expect a successful person to earn in the range £15-£25,000 p.a. A car will be supplied.

Please reply to

The Directors
KNIGHT PROGRAMMING SUPPORT LTD.
27 Noel Street, London, W.1

HOLLAND

CONTRACT DIVISION

OVERSEAS

SYSTEMS ANALYSTS MESSAGE

SWITCHING & COMMS.

FORTRAN POP EQUIPMENT

UNIVAC DMS EXP.

POP FORTRAN IV RSX11M

DOS CICS VS COBOL

BURROUGHS COBOL & DMS DATABASE

PL/1 PROG LONG CONTRACT

ICL GERMAN SPEAKING

HONEYWELL 8000 GCOS

COBOL FORTRAN ADV.

BELGIUM

BELGIUM

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IRAN

HOLLAND

HOLLAND

PARIS

GERMAN

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£450 p.w.

£450 p.w.

£400 p.w.

EXCELLENT

£400 p.w.

£400 p.w.

£300 p.w.

ENEG

£Neg +

exc expenses

ANALYST PROG IMS COBOL

IMS COBOL PROGS

IBM SYST 3 RPGII

POP RSX11 FORTRAN

POP RSX11 OR MACRO II

SNR ANALYST DATABASE

DESIGN

ICL 1900 GII COBOL BILLING EXP

ICL 2900 VMES COBOL

BEOS

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HERTS

HERTS

STH WALES

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100, 101, 102, 103, 104

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LONDON 01-935 0671
Freeport 4, 102 Blandford Street,
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Computing
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Association

EDITOR

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The post offers a great opportunity to a technically-minded writer wishing to make his/her mark on a new publication with enormous growth potential.

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Tel. Woolhampton 2241



MERSEYSIDE COUNTY COUNCIL

DIRECTOR OF COMPUTER SERVICES

JOINT COMPUTER UNIT £9993 to £10569
including supplement

The successful candidate for this post will lead the Merseyside joint computer unit, which has responsibility for data processing for both the county council and the passenger transport executive. In addition work is done for and advice provided to Merseyside Police on computing matters.

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The director must be professionally or academically qualified and must also be able to demonstrate proven and broad based knowledge of computing, and extensive management experience additionally, experience of large machine management involving the provision of an operational and development service to multiple locations users would be advantageous.

General local government conditions of service apply to this appointment, including the provision of Car allowance and generous relocation allowances where appropriate.

Please write or telephone for an outline job description and application form.

County Personnel and Management Service Officer
Merseyside County Council
P.O. Box 95, Old Hall Street
Liverpool L69 3EL
Tel 051-227 5234 Ext. 2332

The closing date for applications is 3rd August, 1978, with interviews planned for the month.

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ARGUS 700 Computers

Experienced technical authors are required to join a team based in South Manchester producing documentation for the ARGUS 700 range of minicomputers.

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Apply, quoting reference 78WD31/CW to: Mr. W. L. Robinson, Ferranti Computer Systems Limited, Simonsway, Wythenshawe, Manchester M22 5LA, or telephone 061-428 3644 ext. 253 (reverse charges) for further information.

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Computer Centre

DEPUTY DIRECTOR

in the Centre, and for two

SYSTEMS PROGRAMMER

Post: The University Computing Service is based on a DEC 400 system, two PDP11s, a CIL computer for use in the 15,000 Data and the North West Information Computer Network. The Centre has considerable responsibilities in both research and applications in computing and in the development of computing facilities for the new

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Tuesday 18th July 1978
Phone Reading 583455

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Castle Hotel
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Windsor
Wednesday 19th July 1978
Phone Windsor 51011

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Ship Hotel
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1. You will be experienced in designing and implementing systems for mini computer hardware.
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4. The ability to speak fluent German is essential.

ANALYSTS/PROGRAMMERS

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2. Assembler programming experience or equivalent type low level language is essential.
3. You will be expected to work on the development and programming of the machine software as well as becoming involved in a certain amount of systems design.
4. The ability to speak German will be an advantage but this is not essential.
5. Any experience of communications software will prove valuable.

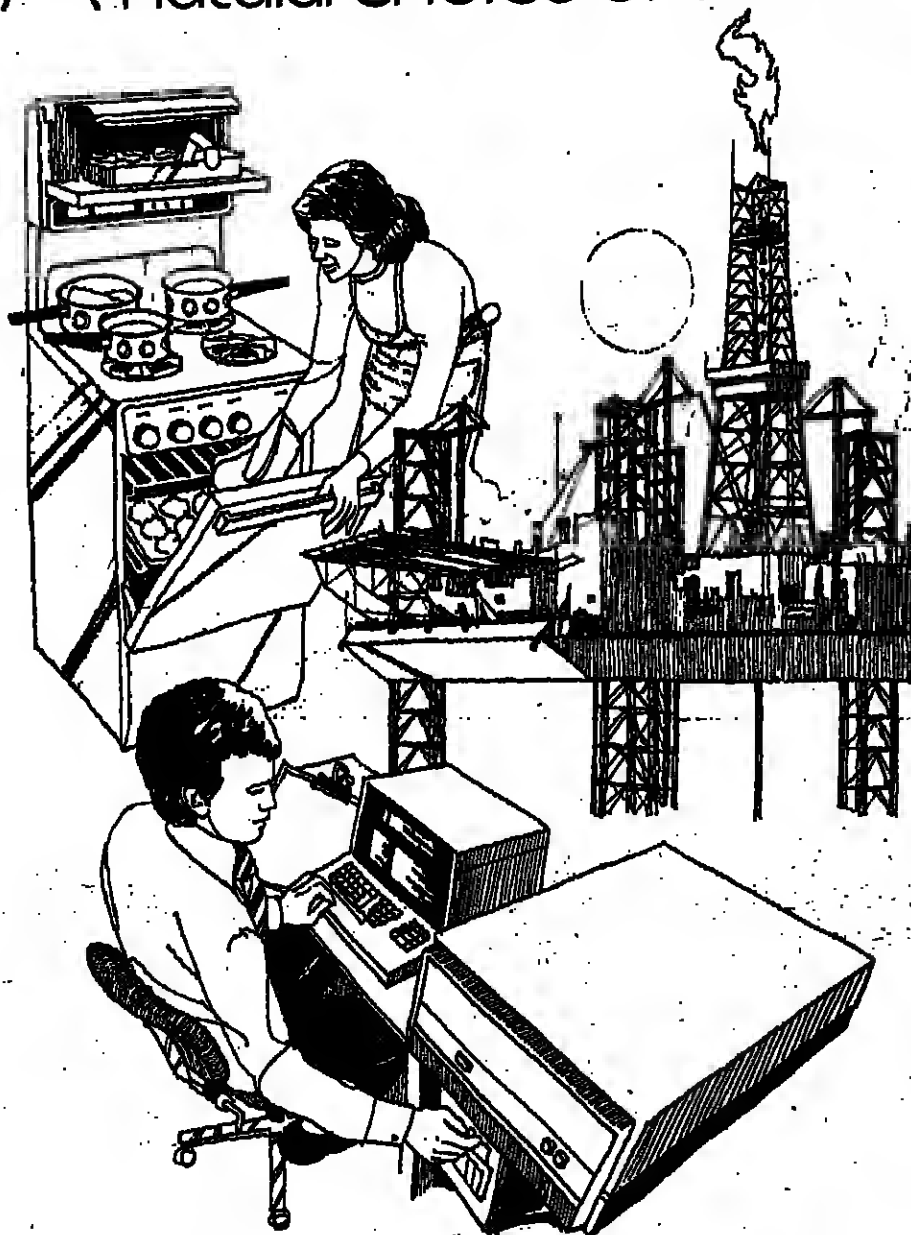
These are permanent positions and relocation expenses will be paid.

PLEASE TELEPHONE OR WRITE TO US IMMEDIATELY SO THAT INTERVIEWS CAN BE ARRANGED IN LONDON OR THE SOUTH.

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Regional Computer Centre-

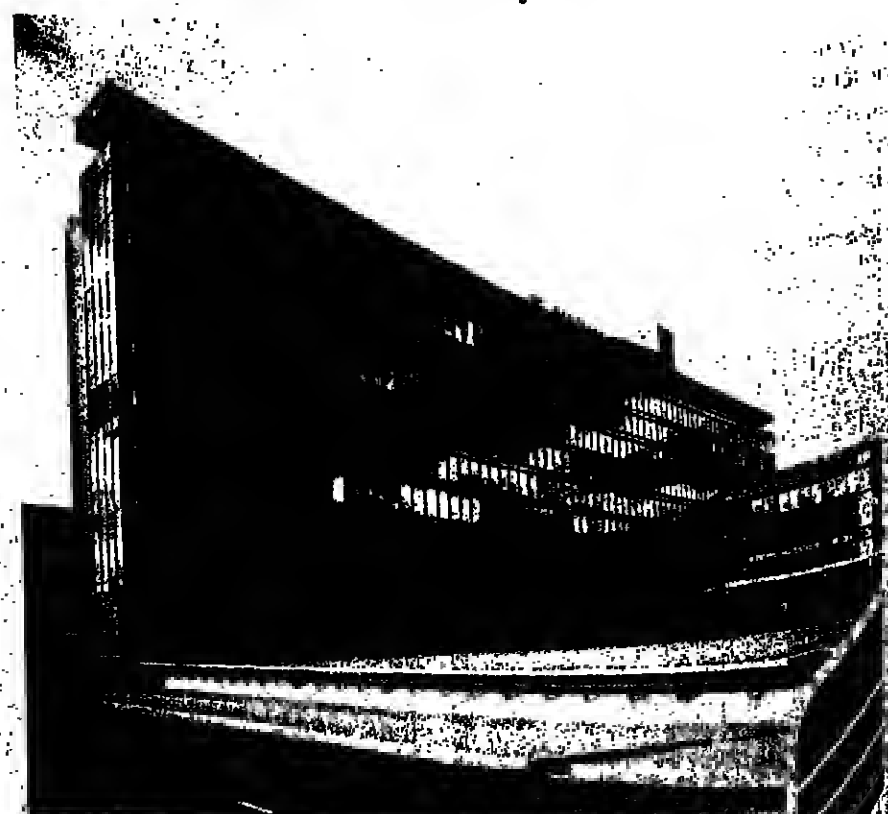
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MEMOREX

WEST MIDLANDS COUNTY COUNCIL

TRANSPORTATION & ENGINEERING DEPARTMENT
URBAN TRAFFIC CONTROL — WEST MIDLANDS
SYSTEMS ENGINEER £4769 - £5612 — TE 3295
SOFTWARE TECHNICIAN £4344 - £5065 TE 3330

The County Council has two urban traffic control systems installed in Coventry and Wolverhampton based upon Agos 700 and G.E.C. 4080 Computers. A programme of expansion of these systems throughout the West Midlands is planned to commence in the near future.

Two systems software personnel are required to play a leading part in this expansion and to develop the existing systems. Both the posts are based in Birmingham.

SALARIES QUOTED INCLUDE SUPPLEMENT
For further details and an application form write or telephone quoting post reference number to:
The Personnel Officer, West Midlands County Council, 1 Leicester Circus, Queenway, Birmingham B4 7DJ. Telephone 021-360 7824. A telephone answering service operates out of office hours. Return applications by 20th July 1978.

THE UNIVERSITY OF MANCHESTER REGIONAL COMPUTER CENTRE

Director: Professor Gordon Black

Applications are invited for the following vacancies:

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Two to work within a team responsible for the development and support of the SCOPE 2 operating system on two CDC 7600 systems. The third to work within a team responsible for the development and support of the GEORGE 3 operating system on ICL 1908A/1804B. The appointees will be involved in performance evaluation and tuning of existing equipment and planning future requirements. Applicants should be educated to degree standard and should have some experience of systems programming. Experience with either CDC or ICL systems would be an advantage. Ref. 143/78/0/CV.

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To work within a team responsible for the provision, maintenance and implementation of different compilers. Candidates should be educated to degree standard, together with experience with compilers, systems programming and a knowledge of Fortran, with one other high level language. A knowledge of CDC and/or ICL 1900 systems would be an advantage. Ref. 144/78/0/CV.

THREE ASSISTANT COMPUTER OFFICERS

The three posts will be in the documentation and liaison sections which are responsible (respectively) for acquiring technical and organisational information and presenting this in the form of user documentation of high quality, and for maintaining direct links with representatives in all user sites and departments. The work here involves advising and helping users with a wide range of backgrounds and computing expertise. Applicants should be competent in one or more high level languages and be able to communicate effectively. Ref. 144/78/0/CV. Salary for all three posts is £3,185-£5,282 p.a. (U.S. \$).

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- ★ Der Rechtsweg ist ausgeschlossen.

Angestellte von SDI sind von der Teilnahme ausgeschlossen.

Quiz:
After execution of the following code:

CSECT1 CSECT	CSECT1,12	LABEL1 LA	15,8(15,0)
USING	12,D	SLA	11,4
BALR	LM	EX	11,LABEL2
LM	10,12,FIELD2*(12)	BAL	3,LABEL3
COMRG	LR	D,1D	LABEL2 NI
LR	D,1D	LABEL3 EOJ	LABEL1 + 1,0
LABELD CLI	FIELD3,255	FIELD1 DC	AL2(4D96)
EX	11,LABEL2	FIELD2 DC	A(LABEL0, 7,
BC	7,LABEL1		
LH	15,FIELD1	FIELD3 DC	X'FF' CSECT 1)
		END	

QUESTIONS

Answers

1. What does general register 0 contain?
2. What does general register 1 contain?
3. What does general register 3 contain?
4. What does general register 15 contain?
5. Which instruction or instructions have been modified during execution?
6. How do any modified instructions look after execution?

Name

Privateadresse

Tel. privat

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z.Zt.-beschäftigt als

Bitte vervollständigen Sie die oben angeführten Instruktionen und senden Sie diese Seite an:

SDI Competition
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London SW6 4NO

SDI Deutschland
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8000 München 81

GRASP

GRASPV5

EPAT

FLEET

Ref. N5/1307

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OPERATOR £4,600
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Senior Programmer

Responsible to the Chief Programmer, with similar experience of the equipment and techniques detailed above.

Analyst/Programmer

To join our operations support team which entails user contact and responsibility for the enhancement of a wide range of applications systems.

Programming is in Cobol but some knowledge of Plan and/or RPG2 would be advantageous, especially for the Analyst/Programmer position.

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AGNC Marconi Ltd.

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Write for an application form and further details quoting reference CO 778, to:-

**The Menagar, Zambia Appointments
Division, Zimco House,
129-139 Finsbury Pavement,
London EC2A 1NA.**

**RCM
NCCM**

**Dorset County Council
DORSET POLICE**

Computer Systems Analyst/Programmer

Meade Road Police Station, Bournemouth

Applicants should have mini computer experience in particular with MACRO-11, CORAL 66 and RSX-11M. Salary within the grade SO1/2 £4,759 by increments to £5,512 inclusive of supplements. (Salary at present under review.)

Application forms returnable by 28 July and further details from the Chief Constable, Police Headquarters, Wimborne, Dorchester.

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2. A **SENIOR APPLICATIONS PROGRAMMER** with experience and proven technical capability to join an applications team engaged on systems for interactive data analysis. Ref: RW 28/2
3. A **TEAM LEADER** initially to join a team of six engaged on the design of a peripheral handling system. Subsequently the person appointed will lead the implementation of the system. Ref: RW 28/3
4. A **TEAM LEADER** to take charge of a team of four engaged on the technical design of software to drive interactive terminals. Ref: RW 28/4
5. A **TEAM LEADER** to be responsible for the development of applications programs for interactive analysis. Ref: RW 28/5

All the above posts are situated in residential North London, within easy access to housing at all price levels and abundant social amenities. The positions all carry competitive salaries and large company fringe benefits.

If you have practical experience in any relevant field (e.g. process control, command and control systems, or systems software design) we should be pleased to hear from you.

Telephone **TONY BAKER** on 01-499 4501, any time (24-hour answering service), quoting appropriate reference number, for more information. If you prefer, you can ring him at home on 01-445 3512 evenings or weekends.

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MMB Deities are strengthening support for their N.C.R. 8200 mini-computer installations. A young analyst/programmer, with sound knowledge of COBOL and preferably with mini-computer experience, is required to develop and implement new programs and to assist with the operation of existing systems at seven sites throughout England. Reason of the Assistant Divisional Accountant, who has to date co-ordinated and supported the computer function without assistance, the successful applicant will be based in Redditch, but must enjoy travel and dealing with emergency situations.

An attractive starting salary is offered which is dependent upon age, experience and qualifications. Excellent conditions of employment include a contributory pension fund, free life insurance and subsidised staff dining room.

Please write or telephone for an application form to:
G. Sanderson, Divisional Accountant, Quinns Dairies Limited, Earliest Road, Washford, Redditch, Worcestershire. Tel: 0527 24651.

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systems programmer

International banking group in Brussels is looking for a systems programmer to assist with the development and maintenance of real-time financial systems. He is to develop, implement and document systems/application software and to provide technical support for computer operators.

Two NCR criterion are in use.

Applicants are expected to have at least 2 years experience in NCR NEAT-3 and should be familiar with NCR operating systems. Some knowledge of TP and NCR terminals would be an advantage.

Individuals with similar experience on non-NCR equipment will also be considered.

Salary offered corresponds to his experience and value with a 13th month and several extra-legal advantages.

Call for more information or for an appointment on 031/36.00.18 Saturday or Sunday from 14 to 16 pm. On weekdays 02/539.04.69 from 9 to 18 pm, or write under reference 80/1873 - Systems Programmer.

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The E.M.S. consulting group has a large quantity of vacancies for additional Analysts to handle expanding systems requirements in the North West region. Candidates should have a minimum of 2 years' systems experience and preferably although not essentially, post programming experience. Our major current requirements are for both Analysts and Senior Analysts to work on commercial systems development. Projects will include Ledger Systems, Stock Control, Warehousing and Distribution, Chain Store Systems, Database and Network Systems. Ability to work in conjunction with client team members and maintain a high professional standard will be important. Relocation assistance will be paid where appropriate. Telephone our Birmingham Office urgently for early interviews on 021-454 7908 (Doris Filby/Don Philp). Please complete the attached application form in addition and return to Newcastle, Staffs today. Over 20 current vacancies are available at very attractive salary levels.

TOP SALESMEN

E.M.S. is planning substantial further development of both our Consultancy and Turnkey Systems Divisions during the coming months. Our Consultancy activities extend across all mainframe ranges and encompass a wide range of industrial/commercial organisations. Applications must, therefore, present as high level Business Analysts capable of rapidly assessing clients' requirements and proposing relevant solutions where appropriate or quantifying the relevant consulting experience required in either systems or programming and providing the necessary staff from E.M.S. resources. A vast potential market exists for salesmen marketing resource support.
Equally our Turnkey Systems Division provided total U.K. coverage,

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We currently have a large volume of vacancies throughout the Birmingham and West Midlands regions, including a wide variety of new jobs at all levels, including E.M.S. Data Centre.
COROL and ASSEMBLER programmers should complete our application forms today as no urgent priority. We have an unparalleled range of opportunities in addition to hundreds of client vacancies. E.M.S. offers interesting and challenging vacancies within our Turnkey Systems Division for candidates working the opportunities of constantly working on development projects within a number, attractively furnished Data Centre, which are involved throughout the Midlands. Equally, please complete our recruitment consultancy in the country. The opportunities available for a few minutes initial correspondence the lucrative career opportunities forthcoming for you make your turn with the investment.
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Experienced Salesmen capable of developing their own territories are urgently required. A substantial quantity of leads are available, extensive and vigorous advertising campaigns and Royal Show support. Salesmen must possess an adequate mini-computer knowledge for Systems positions. Cars will be provided with adequate base salaries and prospective incentives. Apply by telephone for interview during the week at our Birmingham Data Centre. All U.K. territories will be considered pending regional development of other Centres.
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We have many contract vacancies advised each week. Telephone now for a Contractor's profile form urgently and we will offer you an unrivalled selection of opportunities each month. Even if you are not available for a month or two, register today and let us reserve top opportunities for you to be phased on to later. Telephone 0782-623665 (10 lines). Don Philp, Don Walklett, John Wood, Seline Mills.

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Candidates should have experience in Assembler plus OS/VS or MVS for maintenance of operating systems software on medium scale IBM 370 systems. English is essential and knowledge of French or Dutch desirable.
The company offers to successful applicants good working conditions as well as an attractive package of compensations plus legal and extra-legal benefits. Please send detailed C.V. to:

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Applications are invited for the above newly-created post within the University Group of the Laboratory.
The duties of the post will include evaluation of and advising on data communications equipment, testing and maintenance of communications equipment, involvement in the choice and installation of a new local mainframe computer. Experience in some of the above fields is essential.
The Laboratory offers a computing service to all members of the University. The University's mainframe computer is a CDC 3600/44 computer and is the central DASH network of Universities within North-East Scotland. The main computer is sent to the Honeywell 66/80 at Aberdeen University.
Candidates should have a good honours degree, or equivalent, in Computer Science, or a related subject, and a few years' experience. Applicants from outside the U.K. should have a minimum of 2 years' experience. Applicants may also be considered for the post on a part-time basis. The salary is £6,000 to £8,100 per annum, plus a review at 1:1:0.21 with membership of the U.S.S. superannuation scheme.
Further particulars should be obtained from the Establishment Officer, the University, College Gate, St. Andrews, Fife, KY16 9JX, with whose applications together with the names of three referees, should be lodged by 6th October, 1978.

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A first class opportunity to work with a major software company. With at least three years' computer experience and knowledge of IBM 1401/1410 you will be greatly appreciated and well rewarded. Your efforts by this expanding company in Central London, King's Cross, London, NW1.
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WANT TO WORK IN GERMANY?

One of Germany's largest insurance corporations located near Frankfurt on Main is in the process of extending its DP-Facilities into a nationwide TP-Network with large central integrated databases in OS/MVS/IMS. The present configuration consists of 2 x 370-156 with comprehensive 3350 disk drive and extensive TP-applications. The future plan calls for extension with two 3033 systems in order to install OS-specialists.

OS/SYSTEMS PLANNERS OS/SYSTEMS PROGRAMMERS £12-15,000 p.a.

Candidates will be employed in the following task areas:
1—Complete planning of the service centre's hard- and software
2—Implementation and maintenance of DB/DC software
3—Tuning of the TP-systems

Knowledge of the German language would obviously be an asset, however, is not essential as all members of the systems team speak English. Successful candidates will be given a crash course in German. Requirements for consideration include: extensive Assembler experience as well as good command of OS; possibly COBOL. Desired is also experience with CICS, VSAM and possibly experience with data bank systems in particular IMS.
The company offers excellent job security in one of Germany's largest insurance organisations and challenging work in the field of systems software planning and engineering.

Initial contracts by telephone for additional information are welcome or submit your C.V. with references and a recent picture directly to the consulting organisation in charge. Your application will be treated with utmost discretion. Interviews will be conducted in London towards the middle of October.

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THE LIBRARY ASSOCIATION BIBLIOGRAPHICAL AND INFORMATION SYSTEMS OFFICER

The Library Association Council has approved the creation of a new post in the Association's Secretariat, working directly to the Deputy Secretary of Bibliographical and Information Systems Officer. The post will be responsible for the Association's concerns in bibliographical standards and bibliographical systems and services, on-line developments, computer software, and hardware developments. The creation of a national team for the development of standards to systems (including Post Office aspects and standards), coordination of the use of nationally provided services, and also to ensure professional involvement in current international developments in these areas, e.g. Unesco and Council of Europe programmes.

It is expected that the successful applicant will have a wide knowledge of general information and bibliographical information systems and services, nationally and internationally, and will have some recent experience of work in on-line systems.

The post offers an exciting opportunity for someone with energy and imagination to work at the centre of this activity.

The salary agreed by L.A. Council is on a scale rising to £5,985 p.a.

Persons interested should apply in writing to the Deputy Secretary's Department, The Library Association, 7 Ridgmount Street, London WC1E 7AE, for a detailed job description. Previous applicants should not re-apply.

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Up to £4,150 (including shift allowance)

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Vacancies now exist for experienced Computer Operators to join our team. We run a two-shift system where each shift will be responsible for on-line operations, Data Control and the Media Library.
The successful applicant will have had at least one year's experience on a large multi-programming machine. We offer the usual excellent public service conditions, including 22 days holiday, a restaurant and good sports and social facilities.
If you are an ambitious person keen to develop your technical and personal skills, telephone 01-701 2870 anytime for an application form or write to:
The Personnel Officer, Legion Borough of Southwork, 27 Packham Road, London SE8 6JH, quoting reference C/8/810 and job title Coding data 6/10/78.

Southwork

FORTRAN

Major computer company requires experienced FORTRAN programmer. Salary: £3,000 to £4,000 p.a. plus benefits. Apply to: Southwork, 27 Packham Road, London SE8 6JH, quoting reference C/8/810 and job title Coding data 6/10/78.

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To operate, on a 2-shift system, a 192K 1903T (soon to be upgraded to a 194AS) running under the George 3 Operating System. He/She must have at least 18 months' experience, plus commonsense, initiative and willingness to play a full part in operating present — and developing future — applications. Opportunities for promotion in the operating and development divisions. 21 days annual leave, plus 10 statutory days. Staff restaurant. Season ticket scheme.

Written applications, giving age, full details of education and career to date, to: Computer Services Manager, Computer Centre, Town Hall, London SW1B 2PJ, by 28 September.

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SENIOR TECHNICIAN Post 387

To carry out varied duties in support of academic staff in a busy department which is involved with many other disciplines. Duties include preparation of demonstration materials and supervision of audio-visual equipment. There will be a substantial involvement with the Polytechnic's mainframe computer and the departmental DPM computer. A Junior Technician will assist with these duties.
Minimum qualifications: HND or equivalent in a mathematical or computing subject. Experience in computer programming is desirable.
Salary: Scale 1, £3,420-£4,320 plus £342 supplement.
Applications are available from the Staff Office, Portsmouth Polytechnic, Armada House, Museum Road, Portsmouth, or by telephoning Portsmouth 37441, or writing to: The Personnel Officer, Portsmouth Polytechnic, Armada House, Museum Road, Portsmouth, PO6 3PU.

PROJECT LEADERS/MANAGERS

WEST END

to £8500

Our client, a major UK Software Services Group, is urgently seeking high-calibre project leaders with experience of either mainframe or microcomputer commercial systems. Several years relevant D.P. experience is required, and although a successful previous leadership record would be an advantage, candidates with lesser experience who can demonstrate real potential will also be considered. Travel within the UK and Europe may be involved in some cases. Ref. B12/4A.

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WEST END

to £8500

The same Software House client is also anxious to recruit a number of COBOL programmers to play a significant role in the continued planned growth of the company. Successful candidates, who may have a background on any of the major mainframes, can look forward to working in a stimulating environment with varied and interesting assignments. Exceptional scope for career development is offered to high-calibre people. Ref. B12/4B.

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CITY OF LONDON

Analysts to £7000
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Our client, a major commercial bureau using Burroughs hardware, wishes to recruit a number of COBOL programmers and analysts. Programmers should have a minimum of 18 months COBOL experience, preferably on Burroughs medium-range hardware, while analysts should be able to demonstrate experience in the successful design and implementation of at least one major project. Ref. B12/5.

For more information about these and many other opportunities, please write or phone Mike Ooran. All replies will be dealt with in strictest confidence.

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PLI	Burton-on-Trent, Chatham, City, Croydon, Guildford, Harmondsworth, Horley.
RPGII	Bury St. Edmunds, Cambridge, City, Colchester, Crawley, Granford, EC2, Handon, Ipswich, Kingston, Wembley.
Analysis	Bury St. Edmunds, City, Colbrook, Crawley, Dagenham, E7, Harlow, Ipswich, N17, Rayleigh, Richmond, Romford, SW1, Slough, Stevanaga, Sutton, WC2, Whyteleafe.
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If you would like:

- * To receive training in advance IBM software
- * Develop COBOL programs involving database and TP systems
- * Work on a variety of applications projects
- * Five weeks' holiday a year
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- * To join an active sports and social club

— and you have a minimum of 12 months' COBOL programming experience, then this could be a good opportunity to accelerate your career.

Ref. W12/108

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EDITOR FOR COMPUTER WEEKLY

An editor is required for Computer Weekly, Britain's leading computer publication which is distributed to more than 82,000 computer personnel in the UK every week, and to a further 12,000 overseas readers ten times a year.

The post, one of the major editorial positions in the UK technical press, will, ideally, be filled by a person with experience of both journalism and the computer industry.

The successful candidate will be required to maintain the high technical and reporting standards which have been built up over the past twelve years, making Computer Weekly the leading newspaper of the computer business.

In this task the editor will be able to call on a team of 14 journalists whose technical ability and experience are second to none in the field of computer publishing.

Directing and motivating this team, and formulating the editorial policy in conjunction with the publisher will be the editor's main responsibilities.

The salary is negotiable, depending on the successful candidate's qualifications and experience, but will be commensurate with the position of Computer Weekly as one of the most important journals to be published by IPC Business Press.

Please apply to Chris Hipwell, Publishing Director, IPC Electrical Electronic Press, Orsett House, Stamford Street, London SE1.

SYSTEMS ANALYST/PROGRAMMER

This is an exceptional opportunity for an Analyst/Programmer seeking additional responsibility in an expanding company.

We require an Analyst/Programmer to take responsibility for the day-to-day control of our IBM Systems 32 department, the maintenance of all existing systems and the development, design and installation of further applications in the commercial field.

The successful applicant will have programming experience, and a knowledge of RPG II.

Salary for this important position will be in the region of £5-£6,000 in addition to this the company operates a contributory Pension Scheme.

For further details apply to: P. A. Come, Sridha Vekala Ltd., 238 Bath Road, Slough SL1 4DU. Tel. Slough 26261.

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Applications are invited for the post of

A scientific background (a Honours degree level would be an advantage) and a knowledge of the use of a computer in the field of Obstetrics and Gynaecology. The successful candidate will be responsible for the development and maintenance of computer programs used in the clinical setting. The successful applicant will work in a small, lively research department with a lot of scope for creative development.

A scientific background (a Honours degree level would be an advantage) and a knowledge of the use of a computer in the field of Obstetrics and Gynaecology. The successful candidate will be responsible for the development and maintenance of computer programs used in the clinical setting. The successful applicant will work in a small, lively research department with a lot of scope for creative development.

LECTURER II IN COMPUTING
Applications are invited for the above post. The person appointed will join a group of staff concerned with the teaching of Computing throughout the Polytechnic.

Applicants should be well qualified in computing and have teaching, research and/or industrial experience. Candidates will be expected to have a special interest in the application of computing to business, commerce and/or finance and be prepared to undertake or supervise research.

Burnham F.E., Lecturer II £4101-£6568 p.a.
For further particulars and an application form, returnable by Thursday, 28th September, 1978, please send a stamped addressed envelope to: The Staffing Officer, Newcastle-upon-Tyne Polytechnic, Elwell Building, Elwell Place, Newcastle-upon-Tyne NE1 6BB.

OPERATORS

JOB SPOT
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£5,850 DAYS UNIT

Our clients have recently upgraded their computing facilities to ICL 2901 and are currently seeking an Operations Supervisor to be responsible for the day-to-day control of the system. The successful candidate will be required to maintain the high technical and reporting standards which have been built up over the past twelve years, making Computer Weekly the leading newspaper of the computer business.

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THE SALES BIT
Most insular
language of all

ONE of my principal interests is the operational side of theatre, which involves anything from production (to set-painting). After an evening rehearsal the standard procedure is to drift to the bar and discuss the play or whatever topic comes to hand.

One of my friends at the theatre, who has since left, works in the computer industry, so inevitably conversations between us often drifted into the computer arena.

"The other day I was at the theatre and was talking to one of my colleagues who had not realised the reason for the departure of my computer industry friend was his relocation due to a change of employer."

"Is he still in the shipping industry?" he asked. "Shipping?" I replied. "No, he's a systems programmer."

"A what?" he asked. "In the computer industry," I explained. "I see, that's a change. I was never absolutely sure about what he did before, but from the sound of things, he either used boats or built them."

I was very surprised to discover this new facet of my friend. "I didn't know that."

"Oh yes," said my theatrical friend, "he was involved with deck equipment. I heard him mention it several times."

My first reaction was to laugh hysterically, but the look of absolute conviction on his misinformed face made me see him momentarily as a prospective first-time computer user. He knows nothing of computers, and therefore related the language presented to him to the context of his own experience. The result, misconception and confusion.

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TRADER

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flexible VDU

SUPPLIED as standard with the GTM 900, the VDU is marketed in the UK, Scope Data Systems have introduced a flexible video terminal that can be set up to one of three modes: CPU, known as a basic attached processor, the terminal has its own video controller and processor to give faster response times. It can have between 16K and 128K bytes of MOS.

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Puzzle answer
The single figure is 1000.

1000

